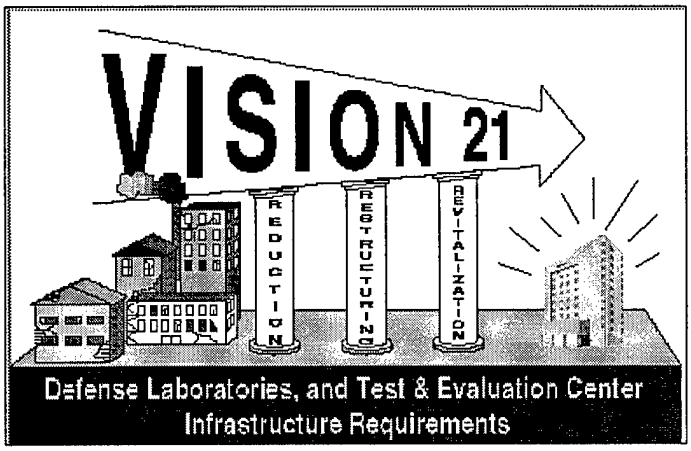

Vision 21

The Plan for 21st Century Laboratories and Test and Evaluation Centers of the Department of Defense

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Report to the President and Congress

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The Plan for 21st Century Laboratories and Test and Evaluation Center of the Department of Defense

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EXECUTIVE SUMMARY

DoD VISION

Based on direction from the Office of the President and provisions in the National Defense Authorization Act for Fiscal Year 1996, the DoD is preparing a plan for its laboratories and test and evaluation (T&E) centers for the 21st century. This plan, called *Vision 21*, will be based upon the requirements to support the development and test and evaluation (T&E) of current and future weapon systems and will identify the critical laboratories and T&E centers needed to achieve them. The plan will rest on three implementing and integrating pillars: **Reduction**, **Restructuring** (intra-Service and cross-Service), and **Revitalization** to attain a modern, efficient, and effective laboratory and T&E center environment with focus on the costs of facilities and infrastructure. *Vision 21* will include options to achieve a goal of reducing the cost of the DoD laboratory and T&E infrastructure. One option will reflect reductions in the laboratory and T&E infrastructure each by at least 20% beyond Base Realignment and Closure 1995 (BRAC). The adopted plan will be implemented over a five year period (FY 2001-2005).

PROCESS

A high-level integrated process team (IPT), chaired by the Under Secretary of Defense (Acquisition and Technology), will be formed to guide this effort. The plan baseline will be the DoD laboratory and T&E center infrastructure as of the completion of all BRAC-related actions and will include other actions completed as of 1 May 1996. Any non-BRAC consolidation/ downsizing taking place after 1 May 1996 may be used to meet the study objectives. Both intra-Service and cross-Service approaches will be studied; the laboratories and T&E centers will be studied separately but the studies will be coordinated on a continuing basis.

Specific criteria for the plan have been provided by both Congress and the Office of the President. In addition to these criteria, the plan will determine the minimum essential set of capabilities, facilities, and installations necessary to maintain defense technological superiority and required capacity in a rapidly evolving threat environment. It will compare the existing capabilities, facilities, and installations with the minimum essential set to quantify the level of reduction, restructuring, and revitalization.

LEGISLATION

The intent of the DoD is to form a strong partnership with Congress in achieving Vision 21. Clearly, Congress will need to enact appropriate enabling legislation to implement this vision.

SIGNIFICANT CLOSURES & REDUCTIONS

The DoD laboratory and T&E center infrastructure has already gone through several reduction efforts. Four rounds of Base Realignment and Closure (BRAC) have led to a significant

number of closures and realignments, and others are scheduled to be completed by FY 2001. The Services have also taken their own initiatives to complement the BRAC actions by streamlining their laboratory and T&E center structures, facilities, workforce, and procedures.

A 29% reduction in the RDT&E workforce from FY 1992 to FY 2001 is contained in the FY 1997 President's Budget. This has moved and will continue to move the DoD laboratories and T&E centers toward more efficient operations. This move toward efficiency is further enhanced through the Reliance process and the follow-on Defense Technology Area Plan (DTAP) process. The T&E Executive Agent management structure was created at the Vice Chief of the Services level to accomplish similar objectives. Both are designed to optimize joint-Service synergy and address unnecessary duplication and overlap. Along these same lines, a NASA/DoD study will seek consolidations and cost savings to both agencies' facilities.

REINVENTION

Reinvention Laboratories under the National Performance Review are pursuing changes to existing laws and waivers to unnecessary regulatory guidance. Of particular note is the Congressionally authorized (National Defense Authorization Act for Fiscal Year 1995) Civilian Personnel Demonstration Program in the Service laboratories and centers. The Laboratory Demonstration Program and its follow-on Laboratory Quality Improvement Program (LQIP) have addressed the management processes needed for the effective and efficient operation of DoD laboratories and Naval T&E centers. More advances are needed.

SCHEDULE

A detailed process plan will be developed and submitted to the Secretary of Defense for approval by July 1998. The approved plan will provide a basis for the President's Budget for Fiscal Year 2000 provided to Congress in January 1999. By January, 1997, DoD will identify to the Congress any additional legislation that the Secretary considers necessary in order to accomplish the downsizing and consolidation of the laboratories and test and evaluation centers.

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I. CAPSTONE

A. INTRODUCTION

The DoD is preparing a plan for its laboratories and test and evaluation (T&E) centers for the 21st century. This plan, entitled *Vision 21*, will serve as a blueprint by outlining an ongoing process that will enable DoD laboratories and T&E centers to meet the needs of the warfighter, both now and in the future, despite a changing threat environment and reduced budgets.

Vision 21 will rest on three integrating pillars: **Reduction, Restructuring** (including intra-Service and cross-Service), and **Revitalization** to fully modernize facilities and capabilities. *Vision 21* will be based on the following tenets:

- Excellence requires a continuous search for opportunities to improve DoD laboratories and T&E centers.
- The reengineering revolution sweeping both industry and government offers a rare opportunity to shed many of the old constraints that reduce the productivity and efficiency of the DoD laboratories and T&E centers.
- A bold restructuring plan can satisfy both Congressional and Administration requirements to consolidate and downsize the DoD laboratories and T&E centers.
- New legislative authorities are required in order to maximize the potential now held captive by a lengthy list of statutory requirements and regulations.

The Department views this plan as an opportunity to respond both to Congress and to the Administration with a positive look to the future that leaves behind the remnants of the Cold War, ensures the security of the country, and provides for the necessary modernization of U.S. forces.

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B. BACKGROUND

This plan is intended to respond to several separate study requirements discussed in the paragraphs below.

1. National Defense Authorization Act for Fiscal Year 1996

a. Section 277

Section 277 of the National Defense Authorization Act for Fiscal Year 1996 requires the Secretary of Defense to develop a five-year plan to consolidate and restructure the laboratories and T&E centers of the DoD. The objective is to specify the actions needed to consolidate the laboratories and T&E centers into as few laboratories and centers as is practical and possible in the judgment of the Secretary, by 1 October 2005. A report on the plan is due by 1 May 1996. Congress required that in developing the plan, the Secretary shall consider, at a minimum, certain issues and use existing data. Appendix A contains the language from section 277.

b. Section 265

Section 265 of the National Defense Authorization Act for Fiscal Year 1996 requires the Secretary of Defense to conduct a comprehensive review of the aeronautical research and test facilities and capabilities of the United States in order to assess the current condition of such facilities and capabilities. Appendix B contains the language from section 265.

2. National Science and Technology Council (NSTC) Recommendations

On 25 September 1995, the President directed the DoD, through his endorsement of a report by the NSTC, to submit a report on the DoD laboratories to the President by 15 February 1996 (subsequently delayed to combine with this report required by Congress). The report is to describe the process to develop a plan for downsizing the DoD laboratories, including identification of opportunities for greater efficiency through measures such as cross-Service integration and Service laboratory consolidations. This requirement was based in part on the NSTC's observation that the DoD had not made sufficient progress in cross-Service integration and had not fully exploited the BRAC process as a downsizing tool. Appendix C contains pertinent portions of the NSTC report.

3. Presidential Statement

The President provided general guidance for conducting a review of Federal Laboratories, essentially to explore opportunities for achieving greater economies and efficiencies in laboratory operations, resources, and facilities on an inter-Agency and inter-Service basis. Eliminating regulatory impediments and unnecessary duplication and establishing joint management is encouraged as appropriate. Appendix D provides the President's statement.

4. Deputy Secretary of Defense Guidance

Based on direction from the President and Congress, the Deputy Secretary of Defense (DEPSECDEF) required that the two studies—laboratory downsizing (directed by the President for DoD, DoE, and NASA), and the laboratory and T&E center five-year plan (directed by Congress)—be combined into one integrated effort.

5. High-Performance Computing Resources Plan

Language in the conference report accompanying the bill that became the National Defense Authorization Act for Fiscal Year 1996 (Report 104-450, pp. 701-702) requests the Secretary of Defense to submit a proposed High-Performance Computing (HPC) resources plan by 31 March 1996 that is a "long-term plan for modernization of HPC resources at test and evaluation centers, and for the integration of HPC-based models, advanced databases, and other decision support resources into the RDT&E infrastructure."

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C. PROCESS FOR DEVELOPING THE PLAN

1. Objective

The DoD recognizes the need to monitor continually its requirements for laboratory and T&E center infrastructure, in order to look for opportunities to reduce unnecessary duplication, reduce cost, and maximize the efficiency and effectiveness of its operations. DoD also recognizes that to maintain a technological edge over potential adversaries, modernized capabilities must be available. The solution depends on all of the Services working together toward a common vision. This effort will produce a plan that is consistent with that vision for the DoD laboratories and T&E centers. Called *Vision 21*, it will be based upon requirements for the laboratories and T&E centers needed to support the development and T&E of current and future weapons systems. It will be DoD's blueprint for its future technical support infrastructure. This vision will integrate three pillars:

- **Reduction** of current infrastructure costs with particular emphasis on the elimination of old, high-maintenance, and inefficient facilities while retaining critical capabilities for the future. Options will include reducing the infrastructure costs of both the laboratories and the T&E centers. One option will reflect reductions in both laboratory and T&E center infrastructure by at least 20% beyond the Base Realignment and Closure 1995 (BRAC) by the Year 2005.
- **Restructuring,** to begin with intra-Service restructuring, including business process reengineering, with an emphasis on cross-Service reliance.
- **Revitalization** to modernize aged critical laboratories and T&E centers, with emphasis on technologies of the twenty-first century, cross-Service sharing, improving efficiencies, and reduced cost of operation and maintenance.

To maintain necessary competence and capability, *Vision 21* will pursue all three pillars simultaneously and with equal emphasis.

2. Scope

The development of the plan will begin with an examination of the laboratories (Appendix E) and the T&E centers (Appendix F), and associated business practices.

For the purpose of this study, the definition of a laboratory is any DoD activity that performs one or more of the following functions: science and technology, engineering development, systems engineering, and engineering support of deployed materiel and its modernization. Each military department and DoD agency is organized differently for such functions, but the term embraces laboratories, research institutes, and research, development, engineering and technical activities. It also includes program office engineering functions for all Services. Elements of defense

agencies conducting comparable work will be included in the study.

The definition of a T&E center will be similar to that used during BRAC 95. It will refer to any facility or capability used for purposes of data collection for T&E; that is a set of DoD-owned or controlled property (air/land/sea or space) or any collection of equipment, platforms, automated data processing equipment or instrumentation that conducts a T&E operation; and that provides a deliverable T&E product.

The laboratories and T&E centers of NASA and DoE will be examined for their potential in meeting DoD requirements and where such potential exists, DoD will establish contact with these agencies to develop memorandums of agreement for cross utilization of these facilities.

3. Study Team

The preparation of the laboratory portion of the plan will be led by the Director, Defense Research and Engineering (DDR&E). The T&E portion of the plan will be prepared under the leadership of the Service Vice-Chiefs in their roles as the Board of Directors for the T&E Executive Agent (hereafter called the BoD), augmented by the Director, Test, Systems Engineering and Evaluation, representing the defense agencies. An Integrated Product Team (IPT), chaired by the Under Secretary of Defense (Acquisition and Technology), will be formed. This IPT will include the BoD; the Service Acquisition Executives (SAEs); the DDR&E; the Director, Operational Test and Evaluation (DOT&E); and the Director, Test Systems Engineering and Evaluation (DTSE&E). The IPT will set the policies and framework for the conduct of the laboratory and T&E center studies and will be the focal point for bringing the two initial plans together and for producing a final single plan. Figure 1 illustrates the process that will be used to coordinate the laboratory and T&E center studies.

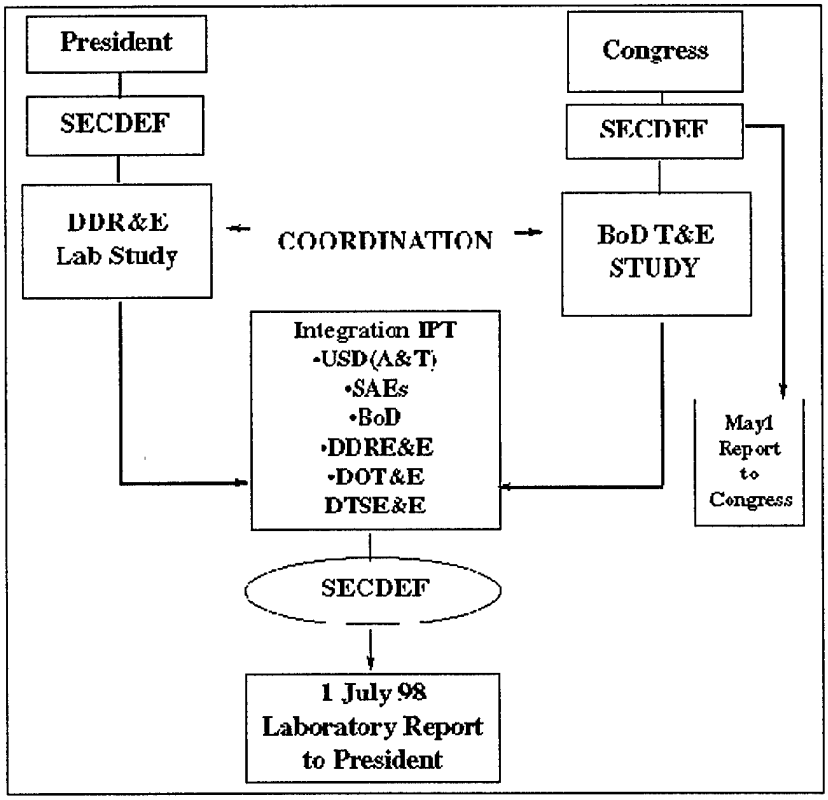

Figure 1. Coordination of Overlapping Consolidation Studies

4. Baseline

A number of major initiatives are ongoing that will result in significant reductions in DoD laboratory and T&E center personnel and infrastructure. This plan will be based on an analysis of which DoD laboratory and T&E center facilities and programs will be required to maintain U.S. defense technological superiority into the 21st century. It is the intent of the Secretary of Defense to measure further consolidation and downsizing after all BRAC actions, ongoing or planned, have been completed. Appendix G contains a list of all such BRAC actions. Thus, the baseline for this study will consist of the DoD laboratory and T&E center infrastructure at the completion of all BRAC-related actions and other actions completed as of 1 May 1996. Any other consolidation/downsizing after 1 May 1996 may be used to meet the plan objectives.

5. Precepts

The following precepts will form the foundation for the study efforts:

- Establish a baseline of what has been accomplished to date and build upon it. All options identifying reductions to the laboratory and T&E center studies will be in addition to reductions resulting from implementation of BRAC 95 decisions.
- Reductions in cost will be based upon total cost to the taxpayer. It will include cost savings to programs and users resulting from reengineering business processes.
- Essential technical capabilities and capacities will be retained, including critical real estate; facilities; core competencies; research and test processes; and air, land, and sea space.

6. Approach

The goal in developing the laboratory and T&E center plan is to determine the minimum essential set of capabilities, facilities, and installations necessary to maintain defense technological superiority, and adequately support the acquisition of necessary systems. The plan will be developed as follows:

1. Develop specific detailed ground rules.

2. Develop necessary analysis and data collection plans for the laboratory and T&E center studies; identify data requirements; identify specific areas and assign them to responsible teams; identify specific capabilities that are duplicated or required and assign specific responsibility for these areas; identify specific consolidation, downsizing, and business process alternatives deemed necessary for consideration.

3. Select an independent accounting firm to develop a detailed methodology for comparative cost analyses.

4. Analyze data including that cited in section 277 (the data and results obtained by the Laboratory and T&E Joint Cross-Service Groups in developing recommendations for the 1995 report of the BRAC Commission, and the March 1994 T&E Board of Directors commissioned report); analyze all alternatives and ensure consistency of alternatives with

the cost comparison methodology; oversee the definition and analysis of any development or modernization requirements; perform business process reengineering; oversee collation of the results; and prepare the final plan.

7. The Plan

The plan will define the requirements for Laboratory and T&E center infrastructure and actions to implement Vision 21 in the FY 2001-FY 2005 program. The plan will rest upon the three pillars of **Reduction, Restructuring,** and **Revitalization** as outlined above. It will also lay out a process for sustaining that vision by creating a standing organization for the laboratories, possibly similar to the BoD for the T&E centers. This plan, coupled with the necessary enabling legislation from Congress, will provide the basis to implement effectively the five-year program by the year 2005.

After all considerations, the following actions will be taken:

1. Determine the minimum essential set of capabilities, capacities, facilities, and installations; and determine the least costly business processes necessary to accommodate anticipated workload, and maintain defense technological superiority.

2. Compare the existing capabilities, capacities, facilities, and installations with the minimum essential set to determine the level of reduction, restructuring, and revitalization necessary to maintain defense technological superiority.

3. Initiate the development of the draft Congressional language necessary to provide SECDEF with the additional authority needed to accomplish the revitalization, restructuring, and reduction.

4. Develop alternatives for transferring workload and focusing resources for modernization as appropriate.

5. Identify management impediments at the agency level for correction in order to improve laboratory and T&E center effectiveness and efficiency.

8. Schedule

Congress specified two response dates in the FY 1996 Authorization Bill: a report on the plan by 1 May 1996 and implementation of the 5-year plan by 2005. The President requested a plan for the laboratory study by 15 February 1996. The latter date has been renegotiated to coincide with the plan requested by Congress. With this guidance in mind, the following major milestones apply:

1 May 1996	Provide the report on the plan
1 January 1997	Submit a request to Congress for enabling legislation
1 April 1998	Develop detailed process plans for five-year plan
1 July 1998	SECDEF approval of the five-year plan and submittal of Laboratory Report to the President
1 October 2000	Begin execution of five-year plan
1 October 2005	Complete execution of five-year consolidation plan

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D. RECENT REDUCTION, RESTRUCTURING, AND RELATED ACTIVITIES

There have been a number of separate initiatives that have and continue to result in reduced DoD laboratory and T&E center infrastructure, the most important of which is the BRAC process. It should be noted that the effect of these consolidations and closures has yet to be fully realized. In fact, only about 20% of directed BRAC actions have been implemented thus far.

1. Base Closure and Realignment Commission

As noted above, significant reductions in DoD infrastructure resulted from four rounds of Congressionally approved base closures and realignments in fiscal years 1988, 1991, 1993, and 1995 (abbreviated BRAC 88, etc.). Only the BRAC 88 decisions have been fully implemented. The BRAC 91 actions are currently in process, and only a few of the BRAC 93 and BRAC 95 actions have been started. Clearly, the most significant of the BRAC consolidations and reductions remain to be executed.

A database was created during the BRAC rounds that defines the capabilities, capacities, facilities, size, workload, and manpower of DoD laboratories and T&E centers. Additionally, the data were compared and analyzed by Joint Cross-Service Groups (JCSGs) in many common support function areas during BRAC 95. All of this information, including JCSG recommendations, will be considered in this study, but will have to be updated to reflect approved BRAC actions. Appendices E and F include all laboratories and T&E centers addressed during BRAC 95 by the JCSGs, except those that were closed (Appendix G) plus some additional sites as noted. Other ongoing reduction efforts being taken outside the BRAC process will be considered as well.

The Services are organized very differently from each other to accommodate their respective roles and missions. The laboratories and T&E centers within each Service are organized to best support the functions, philosophy, and policy of their respective Services. Therefore, it is not possible to compare the laboratories and T&E centers of one Service directly and completely with those of another. Similarly, data on reductions in personnel or infrastructures are often not directly comparable. Some reduction actions consolidated many separate activities into a few large coordinated laboratory/center complexes, some with multiple sites, to ensure better intra-Service control and resource investment. In addition to the BRAC reductions, each Service continues to excess, raze, or put into caretaker status older or minimally used facilities and move work to more efficient building space or facilities. Additionally, technical work is being consolidated across sites within each Service, or, if appropriate, contracted out to industry or academia.

2. Reliance

The Services established the Reliance Project in 1990 to improve coordination and reduce overlap and redundancy of their RDT&E programs and facilities. The process has evolved and matured in subsequent years and is currently managed as two separate efforts known as S&T Reliance and T&E Reliance. These are further detailed in Appendices H and I.

3. Laboratory Quality Improvement Program (LQIP)

DoD laboratories and some T&E centers have participated in the LQIP as a means of improving quality and productivity. This program will be described in the

Laboratory Baseline section.

4. Program Budget and Workforce Reductions

A few years prior to 1980, the Defense budget was relatively stable in real terms; but from 1980 to 1985 the Defense budget grew about 50%, with the Procurement and RDT&E Appropriations almost doubling. After 1985, the Defense budget declined, so that by FY 2001 the level is expected to be approximately the same in real terms as it was prior to 1980. The laboratories and T&E centers did not share appreciably in the 1980s' buildup, but have declined significantly since 1990. The DoD workforce devoted to RDT&E is declining as follows:

RDT&E	**Actual**	**Actual**	**Program**	**Change**
Personnel (000's)	FY 1992	FY 1995	FY 2001	FY92 - FY01
Military	20.6	17.7	15.6	
Civilian	100.8	90.3	70.1	
Total	**121.4**	**108.0**	**85.7**	**-35.7 (-29%)**

(1997 President's Budget)

Furthermore, the RDT&E infrastructure is only a small portion of the DoD infrastructure. For example, the RDT&E personnel comprise less than five percent of the DoD personnel.

These reductions are the direct result of the decline in resources. To accommodate these declines while maintaining the highest priority programs, the DoD laboratories and T&E centers have moved to improve efficiency. This move toward efficiency is further enhanced through the Reliance process and the follow-on Defense Technology Area Plan (DTAP) process(both designed to optimize joint-Service laboratory and T&E operations.

5. NASA/DoD Study

In 1995, NASA/DoD Integrated Product Teams were formed to evaluate where consolidations, improvements in efficiencies, and cost savings could be identified and obtained between the two agencies. Particular emphasis was placed on more efficient management of technology programs and the major facilities of both agencies. The teams gathered information on major facilities used by NASA or DoD since 1993 and are being reviewed for future workload requirements.

To ensure future and continual coordination, alliances are being recommended among NASA, DoD, industry, and appropriate universities. These alliances, which will report to the Aeronautics and Astronautics Coordinating Board (AACB), are responsible for monitoring and improving the use of facilities, reducing costs through commonality, and improving test technology by endorsing facility investments. Interagency Reliance and co-management of facilities is being considered, and would have to be considered as part of the Vision 21 plan.

6. DoD Business Process Reengineering

Laboratory and T&E center business processes have been undergoing reengineering under the DoD Corporate Information Management program. Since 1994, methodologies have been developed to promote more efficient ways of doing business among laboratories and T&E centers, and for

developing better integration with other DoD enterprises.

E. LEGISLATIVE BARRIERS

The DoD will require legislation to implement Vision 21. A comprehensive package of legislative proposals and justifications will be developed and submitted to Congress by January 1997, in accordance with the required legislative clearance framework established by OMB Circular A-19.

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II. LABORATORY BASELINE

A. INTRODUCTION

For the purpose of developing a plan for *Vision 21,* the definition of a laboratory is any DoD activity that performs one or more of the following functions: science and technology, engineering development, systems engineering, and engineering support of deployed material and its modernization. Each Service and DoD agency organizes differently for such functions, but the term embraces laboratories; research institutes; and research, development, engineering, and technical activities. The plan will include program office engineering functions for all Services. Defense agencies conducting comparable work will be included in the study. Appendix E identifies the initial laboratories to be considered.

All Army laboratories and Research, Development and Engineering Centers (RDECs) are included in the study.

With the exception of the NRL and several medical laboratories, Navy reductions and restructuring activities for both laboratory and T&E center infrastructures are the same. All Naval laboratories and warfare centers (including T&E centers) will be included in the study.

In the Air Force, the four Product Centers (engineering functions) and their respective laboratories will be included. The portions of the Air Logistics Centers that will be considered are the engineering functions that are not directly related to the depot functions.

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B. MANAGEMENT STRUCTURE

The three Services manage and organize their laboratory structures in accordance with their own requirements and internal organizational structures. For example, the four Air Force laboratories and the Army Research Laboratory focus on Science and Technology work. (S&T may be defined as Basic Research, Applied Research, and Advanced Technology Development. These activities are also known as Budget Activities 1, 2, and 3, respectively.) The Naval Research Laboratory is largely S&T-funded, but performs higher budget activity categories of R&D work as well. By contrast, the Army RDECs and Naval Warfare Centers include S&T and R&D functions, but are focused on development work, acquisition support, and in-service engineering.

Coordination among Service S&T programs is effected under the leadership of the DDR&E through the S&T Reliance process (Appendix H contains a description) and through the Defense S&T Advisory Group (DSTAG). The DSTAG is chaired by the DDR&E and includes the S&T Executives of each Service, the Director of Defense Advanced Research Projects Agency (DARPA), and representatives from other OSD components sponsoring S&T work (e.g., Ballistic Missile Defense Organization (BMDO), Defense Nuclear Agency (DNA)).

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C. PLAN CONSIDERATIONS

During BRAC 95, cross-Service opportunities were investigated through the mechanism of Joint Cross-Service Groups, including a group for laboratories. Methodologies, criteria, and lessons learned will be employed as appropriate during the study phase of developing the plan for *Vision 21.*

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D. REDUCTIONS AND RESTRUCTURING ACTIVITIES

Below are brief summaries of Army, Navy and Air Force BRAC and other related reductions and consolidations of laboratories that are complete or will be completed by the end of FY 2001. More detail on the laboratory-only portion of these activities is summarized in the DoD input to the NSTC study.

1. Army

The Army is continuing to reduce infrastructure in concert with DoD and Congressional guidance. The current plans, as contained within the FY96 President's budget, show a 29% reduction in RDT&E personnel from the FY91 peak year to FY01. The Army continues to participate and heartily support the efforts of Project Reliance. The Army also participated in each of the BRACs in which sites were closed or realigned. They are listed as follows:

BRAC 88 actions closed the Army Material Technology Laboratory (AMTL) in Watertown, MA. AMTL functions were relocated as follows: the ceramics and related research functions to the Tank-Automotive Research, Development, and Engineering Center at Detroit Arsenal, MI; the metal and metal-related research functions to the Armament Research, Development, and Engineering Center at Picatinny Arsenal, NJ; and the corrosion prevention and control related research to the Belvoir Research, Development, and Engineering Center at Fort Belvoir, VA. The relocation of AMTL functions was changed by BRAC 91.

BRAC 91 created the Army Research Laboratory by consolidating management of nine Army laboratories under one command at Adelphi, MD. The following laboratories were disestablished: the Harry Diamond Laboratory (HDL) at

Woodbridge, VA; the Human Engineering Laboratory (HEL) at Aberdeen Proving Ground, MD; the Atmospheric Sciences Laboratory (ASL) and Vulnerability Assessment Laboratory (VAL), both at White Sands Missile Range, NM; and the Electronics Technology and Devices Laboratory (ETDL) at Ft. Monmouth, NJ. BRAC 91 approved the move of AMTL (less Structures Element) from Watertown, MA, to Aberdeen Proving Ground (APG), MD. Two of Army's Major Subordinate Commands in St. Louis, MO -- the Aviation Systems Command (AVSCOM) and the Troop Support Command (TROSCOM) -- were consolidated into the Aviation-Troop Support Command (ATCOM) as a result of BRAC 91. BRAC 91 also required closure of three of the Army's nine medical research laboratories; the Letterman Army Institute of Research (LAIR), the Army Biomedical Research Development Laboratory, and the Army Institute of Dental Research. Several Army medical research programs were realigned. They are as follows: trauma research moved to the Army Institute of Surgical Research, Fort Sam Houston, TX; blood research collocated with the Naval Medical Research Institute (NMRI), Bethesda, MD; laser bioeffects research collocated with the Armstrong Laboratory, Brooks Air Force Base, TX; environmental and occupational toxicology research collocated with the Armstrong Laboratory at Wright-Patterson Air Force Base, OH; medical materiel research transferred to the Army Medical Materiel and Development Activity at Fort Detrick; combat dentistry collocated with the Naval Dental Research Institute of Research at Great Lakes Naval Base, IL; microwave bioeffects research collocated with the Armstrong Laboratory, Brooks Air Force Base, TX; biodynamics research moved from the Army Aeromedical Research Laboratory, Fort Rucker, AL, and collocated with the Armstrong Laboratory at Wright-Patterson Air Force Base.

BRAC 93 moved the Communications and Electronics Command (CECOM) Headquarters out of leased space and into space at Fort Monmouth. Excess facilities and real property will be disposed of at Evans and Charles Woods subposts. Belvoir Research, Development and Engineering Center (BRDEC), Fort Belvoir, VA, was disestablished. The Tunnel Detection, Materials, Marine Craft, Topographic Equipment, Construction Equipment and Support Equipment Business Areas were eliminated. The Supply, Bridging, Counter Mobility, Water Purification, and Fuel/Lubricant business areas were relocated to the Tank Automotive Research, Development and Engineering Center (TARDEC), Detroit Arsenal, MI. Command and control of Battlefield Deception, Electric Power, Remote Mine Detection/Neutralization, Environmental Controls and Low Cost/Low Observables Business Areas were transferred to the Night Vision Electro-Optics Directorate (NVEOD). Vint Hill Farms will close. The Intelligence and Electronic Warfare Directorate (formerly the Signal Warfare Directorate), and the program executive officer (PEO) for Intelligence and Electronic Warfare (IEW) will be transferred to Fort Monmouth, NJ.

BRAC 95 disestablished the Aviation-Troop Command (ATCOM) and relocated its mission/functions as follows: relocate Aviation Research, Development & Engineering Center; Aviation Management; and Aviation Program Executive Offices to Redstone Arsenal, Huntsville, AL, to form the Aviation & Missile Command. Relocate functions related to soldier systems to Natick Research, Development, Engineering Center, MA, to align with the Soldier Systems Command. Relocate functions related to materiel management of communications-electronics to Fort Monmouth, NJ, to align with Communications-Electronics Command. Relocate automotive materiel management functions to Detroit Arsenal, MI, to align with Tank-Automotive and Armaments Command. BRAC 95 changed the recommendation of the 1991 Commission regarding Tri-Service Project Reliance. Upon disestablishment of the Army Biomedical Research Development Laboratory at Fort Detrick, MD, the environmental and occupational toxicology research will not be collocated with the

Armstrong Laboratory at Wright-Patterson Air Force Base, OH. Instead, the health advisories environmental fate research and military criteria research functions of the Environmental Quality Research Branch will relocate to the Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD, and the remaining functions of conducting non-mammalian toxicity assessment models and on-site biomonitoring research of the Research Methods Branch at Fort Detrick will be maintained as part of Headquarters, Army Medical Research and Materiel Command.

2. Navy

The Navy is continuing to execute a long established strategy to consolidate its technical activities into a combined RDT&E infrastructure. This strategy rests upon the Secretary of the Navy's (SECNAV) belief that the most efficient use of Navy laboratories and T&E center facilities and personnel is obtained through shared major resources.

The laboratories conduct test and evaluation in all aspects of a weapon system's life cycle from early research and technology development through retirement from service. This often requires that very complex and costly laboratory facilities be developed to deal with today's complex technologies. Therefore, instead of performing R&D and T&E work at different sites that have similar but separate support infrastructures, the Navy conducts R&D, T&E, and most In-Service Engineering for a program at a single site using the same facilities, equipment, manning, and support activities throughout the life of that program. For example, the Missile Encounter Simulation Arena (MESA) is a $40M facility to develop and dynamically test missile fuzing against Low Observable Full Scale targets. This facility is not part of the T&E MRTFB, but is used by the entire RDT&E community. Efficiencies and subsequent cost savings from this strategy are realized due to:

- salary and benefit savings;
- savings in base operations;
- savings in acquisition program costs due to integrated facility utilization;
- synergistic relationships, creating a core cadre of experts who perform across the system's total life cycle, allowing for required technical support with fewer personnel.

The SECNAV recently applied this strategy in DMR 922 and the overall Navy BRAC process to consolidate infrastructure. Using this strategy, the Navy has made and continues to make significant reductions and consolidations within its own technical infrastructure. Thirteen RDT&E sites are being closed and an additional 27 RDT&E activities that are tenants at other facilities are also being closed. In addition, three of the six aviation depots have been closed. Critical work at these activities is being consolidated elsewhere. A total of 34 commands associated with Department of the Navy technical efforts are being eliminated with concomitant savings in overhead management. Appendix G contains a list of all Department of the Navy closures associated with the two major base closure laws. These actions have resulted in thousands of billet eliminations, and a number of total base closures.

The SECNAV's full spectrum RDT&E center concept and other actions detailed in his RDT&E consolidation plan have led to a new Navy corporate laboratory and four warfare centers.

The Naval Research Laboratory was consolidated from two separate laboratories into a single research laboratory with ocean and atmospheric research and development functions being located at sites that are synergistic with the prediction activities supporting the fleet. Several smaller research activities have been closed

and consolidated into other commands.

The Naval Air Warfare Center (NAWC) focuses aviation RDT&E at two hub locations - the Aircraft Division, with headquarters at Patuxent River, MD, and the Weapons Division, with headquarters at China Lake, CA. A small Training Systems RDT&E Division is at Orlando, FL, collocated with the Army's training systems efforts.

NAWC's weapons RDT&E Center is at China Lake, CA. It has one major weapons sea range at Pt. Mugu, CA (used for both RDT&E and for fleet exercises), and one major weapons land range at China Lake, CA (where the airspace is shared with Edwards AFB, CA, and the Army's National Training Center at Ft. Irwin, CA). Both of the weapons ranges are managed by the Naval Air Warfare Center Weapons Division (NAWCWD) at China Lake. NAWCWD closed its air-to-ground T&E range at the Salton Sea in 1989.

NAWC's aircraft RDT&E Center is at Patuxent River, MD. Unique facilities exist there for carrier suitability, installed systems and aircraft performance and flying quality testing. Technology concepts associated with aircraft are also developed, tested and integrated into systems at this site. Additionally, Patuxent River is home to the Navy Test Pilot School. Army, Navy and Air Force rotary wing test pilot training is conducted at this school. Naval aviation acquisition will also be collocated there in 1997.

Navy command, control, and communications RDT&E and acquisition and all west coast in-service engineering (ISE) are currently being consolidated at the Naval Command, Control, and Ocean Surveillance Center (NCCOSC), San Diego. ISE support on the east coast has been reduced to a single detachment at Charleston, SC, with a small subordinate group at Norfolk, VA. Another detachment is at Pearl Harbor. These activities are collocated near the fleet forces they directly support.

Navy subsurface RDT&E and ISE is consolidated into the Naval Underwater Warfare Center (NUWC) with two Divisions. The NUWC performs total life cycle support from concept exploration to In-Service Engineering. One of the divisions is located at Newport, RI, on the east coast and the other is at Keyport, Washington, on the west coast. Both sites have supporting underwater ranges.

Navy surface RDT&E is consolidated into Naval Surface Warfare Center (NSWC) with five divisions. The NSWC performs total life cycle support from concept exploration to in-service support for surface and coastal warfare systems. It is also responsible for life cycle support on hull, mechanical, and electrical systems for both ships and submarines.

The Navy Department has also actively pursued cross-service opportunities. As a bold BRAC initiative, the Navy has consolidated its test mission for large and small jet engines at the Air Force Arnold Engineering Development Center (AEDC). This allowed for the total closure of the Naval Air Propulsion Center, Trenton, NJ. In addition the Navy has consolidated biodynamics research with the Air Force. Infectious disease research will be consolidated with the Army, and the medical research will be collocated with the Army. Dental research for all three Services has been collocated at a Navy laboratory at Great Lakes, IL, and the Army has collocated its training systems RDT&E programs with the Navy at Orlando, FL.

3. Air Force

The Department of the Air Force has closed the Ballistic Missile Office at Norton AFB, CA. Air Force laboratories have been downsized in place rather than closed.

The DoD recommended that Rome Laboratory at Griffiss AFB, NY and the Human Systems Center (including Armstrong Laboratory) at Brooks AFB, TX be closed and consolidated at other Army and Air Force locations. The BRAC 95 Commission did not endorse DoD's recommendation to close these activities. In December 1990, the 14 separate Air Force laboratories were organizationally consolidated into the four current laboratories to reduce management overhead. Air Force Science and Technology (S&T) laboratories perform and manage all Air Force S&T work, and S&T related efforts.

Under the aegis of the Integrated Weapon System Management (IWSM) Process, the Air Force merged the Air Force Systems Command with the Air Force Logistics Command. The two Air Force activities are now known as the Air Force Material Command (AFMC). The AFMC fosters the Single Manager philosophy so that a weapon system has only one manager throughout the entire life of the system from inception to retirement. The IWSM process ensures that the Program Management, Requirements Determination, Systems Engineering /Configuration Management, Financial Management, Contracting, associated Technology Master Process, Logistics, and Test and Evaluation critical processes are integrated, from a product focus, throughout the acquisition process. Integrated Product Development (IPD) is a cornerstone of the IWSM process and has been totally implemented. The results are reductions in duplication of acquisition functions performed in the AFMC product and Air Logistics Centers and in the critical process infrastructure by streamlining and harmonizing the system acquisition process, including Sustainment Management, as a seamless organization until system retirement. Correspondingly, the Air Force has consolidated its infrastructure to support the development, acquisition, and sustainment of weapon systems.

An Objective Laboratory Model was established to standardize internal laboratory directorate management structure. Consistent with the product focus, the Air Force Laboratories are aligned with each product center they support to facilitate and better manage technology transfer and insertion into weapon systems. Manpower in the four Air Force S&T laboratories has been reduced from 8,493 in FY 1989 to 6,392 in FY 1996 (a 25% reduction) with a further reduction of 1,263 positions by FY 2001. This will result in an overall manpower reduction of 39.6% based on the FY 1989 S&T peak manpower strength. Numerous experimental facilities have been mothballed as a result of manpower reductions and specific changes in technology emphasis. For example, at Wright Laboratory alone, 70,000 sq. ft. of research facilities -- including four wind tunnels, a water tunnel, and an aircraft structural test facility -- have been mothballed since FY 1989.

Many noncore technical areas have been eliminated. Some of these areas include the transfer of nuclear technology and shock physics to the Army and tactical missile propulsion to the Navy. Other areas eliminated include electromagnetic pulse testing, fire control technology development, and traveling wave tube research. In addition, numerous in-house research programs, including Ballistic Missile Defense Organization (BMDO) support, advanced communications, tactical surveillance, mapping/charting/geodesy, and short takeoff and landing/vertical-short takeoff and landing (STOL/VSTOL) propulsion have been reduced. Finally, a number of operating locations and field operating agencies were eliminated/ consolidated, involving over 1,900 positions.

In addition to the above reductions, the Air Force has made major reductions at its Air Logistics Centers. The Air Logistics Centers, which are likewise organized around a product focus to support weapon systems, contain software laboratories, and acquisition and test functions. They are reducing capacity and facilities through downsizing, closure, realignments, and privatization. The Air Logistics Centers have reduced capabilities in supporting depot maintenance repair, intercontinental

ballistic missiles, engine overhaul, and hydraulics. Specifically, the Air Force will close the Aerospace Guidance and Metrology Center and Newark Air Force Base later this year; close Sacramento Air Logistics Center, McClellan Air Force Base, and San Antonio Air Logistics Center by 2001; and realign Kelly Air Force Base by 2001. This leaves the Air Force with only three depots.

The above are examples of the continuing process of internal Air Force laboratory facility and mission reviews, consolidations, and reductions. This process has streamlined the infrastructure with a product focus to more effectively integrate weapons systems development, acquisition, and sustainment using the ISWM and IPT processes.

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E. RELATED MANAGEMENT INITIATIVES

1. Laboratory Quality Improvement Program

The Laboratory Quality Improvement Program (LQIP) was established in 1993 by the Science and Technology executives of the three Services as a means to improve the quality and productivity of the DoD laboratories. The LQIP was chartered by the DDR&E in May 1994 as the successor to the Laboratory Demonstration Program (LDP), which had been established in 1989 to implement a number of recommendations resulting from a 1987 Defense Science Board Summer Study of DoD Technology Base programs. The LDP had achieved a number of successes, but it had been unable to make any progress on its most important initiatives.

Under the LQIP, selected DoD laboratories and Naval RDT&E centers have been designated as S&T Reinvention Laboratories under both the National and Defense Performance Reviews. LQIP initiatives are focused on improving the efficiency and productivity of the DoD laboratories by streamlining their business practices in such areas as civilian personnel, financial management, information infrastructure, contracting, and facilities renewal. The goal is to grant the heads of DoD laboratories increased authority to choose the most cost-effective service providers to operate their organizations in a business fashion.

Specific initiatives include the following:

- Design and implement streamlined civilian personnel procedures under Personnel Demonstration Project authorities granted by Congress in the FY 1995 Defense Authorization Act.
- Design and implement streamlined R&D contracting procedures.
- Improve facility renewal through the use of the increased minor construction thresholds granted by Congress in the FY 1996 Defense Authorization Act.
- Design a financial management approach that will permit the identification and comparison of the true costs of doing business at the DoD laboratories and centers.
- Create an information infrastructure with more commonality among the Services to aid bench scientists in exchanging critical information.

2. S&T Reliance

In 1990, OSD and the Services took the initiative to improve the efficiency and effectiveness of DoD S&T by establishing the S&T Reliance process. The objective continues to be the elimination of duplication and improved coordination and integration of Service S&T programs by eliminating marginal efforts and transferring them to technical centers with more capabilities, regardless of the

Service. Initially, only the three Services participated in the Reliance process; however, it has since been expanded to include some Defense activities (e.g., Defense Advanced Research Projects Agency (DARPA), Defense Nuclear Agency (DNA), and Ballistic Missile Defense Organization (BMDO). In 1995, S&T Reliance began to evolve into a more comprehensive process as a part of a new DDR&E-developed strategy and planning process for the entire Defense S&T program. This process, described in Appendix H, focuses on ten technology areas that are considered key to enhancing high-priority joint warfighting needs of the Services. These are as follows:

- Air Platforms
- Chemical, Biological Defense and Nuclear
- Materials/Processes
- Ground Vehicles and Watercraft
- Space Platforms
- Information Systems and Technology Weapons
- Sensors and Electronics
- Human Systems
- Medical and Biomedical

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DDDR&E(LM&TT) | LabLINK

Vision 21

The Plan for 21st Century Laboratories and Test and Evaluation Centers of the Department of Defense

Report to the President and Congress

Index:

A. Introduction
B. Management Structure
C. Plan Considerations
D. Reductions and Restructuring Activities

III. TEST AND EVALUATION CENTER BASELINE

A. INTRODUCTION

For the purpose of this study, the definition of a T&E center will be similar to that used during BRAC 95. That is, any facility or capability that will be used for data collection; and will be DoD-owned or -controlled property (air/land/sea or space) or any collection of equipment, platforms, automated data processing equipment, or instrumentation that conducts a T&E operation; and that provides a deliverable T&E product. Appendix F identifies the initial DoD T&E centers to be considered.

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B. MANAGEMENT STRUCTURE

The Major Range and Test Facility Base (MRTFB) is a national asset comprised of the 21 principal T&E centers, including ranges. In 1971, DoD established special oversight for the MRTFB and specific management procedures that incorporate uniform management and pricing policies. This fosters joint use by all Services, and eliminates unwarranted duplication. T&E is a DoD mission where all Service facilities are managed for joint use. Last year, Congress directed that MRTFB facilities be made more accessible to commercial users through reduced charges. This also will increase utilization of T&E facilities. Since users of the MRTFB pay for and are the only source of funding for all direct costs of test services, the size of the MRTFB work force is self-regulating. T&E facilities need adequate capacity in order to provide support that is cost effective to weapons programs and the DoD as a whole. The question is how much is enough. During the development of the plan, the optimal amount of capacity will be considered. DoD continually improves management of T&E infrastructure. Management processes analyze current infrastructure and planned investments to ensure that T&E infrastructure is sized to support current and future workload while minimizing overall cost.

DoD's most recent major management initiatives are T&E Reliance and the T&E Executive Agent structure. T&E Reliance, created in 1990, improves DoD joint T&E planning. It promotes coordinated centralized investment planning without inhibiting decentralized execution. Reliance helps steer informed decisions on investments, reductions, and closures. A Reliance Lead guides a joint team of functional experts that identifies unwarranted duplication, makes recommendations to improve test facility management, and is responsible for evaluating all Service T&E resource needs and solutions within the functional area.

On 1 October 1993, the USD(A) approved the Services-proposed T&E Executive Agent management structure shown in Figure 2. This structure retains OSD in its role of policy formulation and oversight but gives more DoD corporate responsibility to the Services. Further detail, including Reliance areas with current lead Services, and the comprehensive investment review process, is contained in Appendix I.

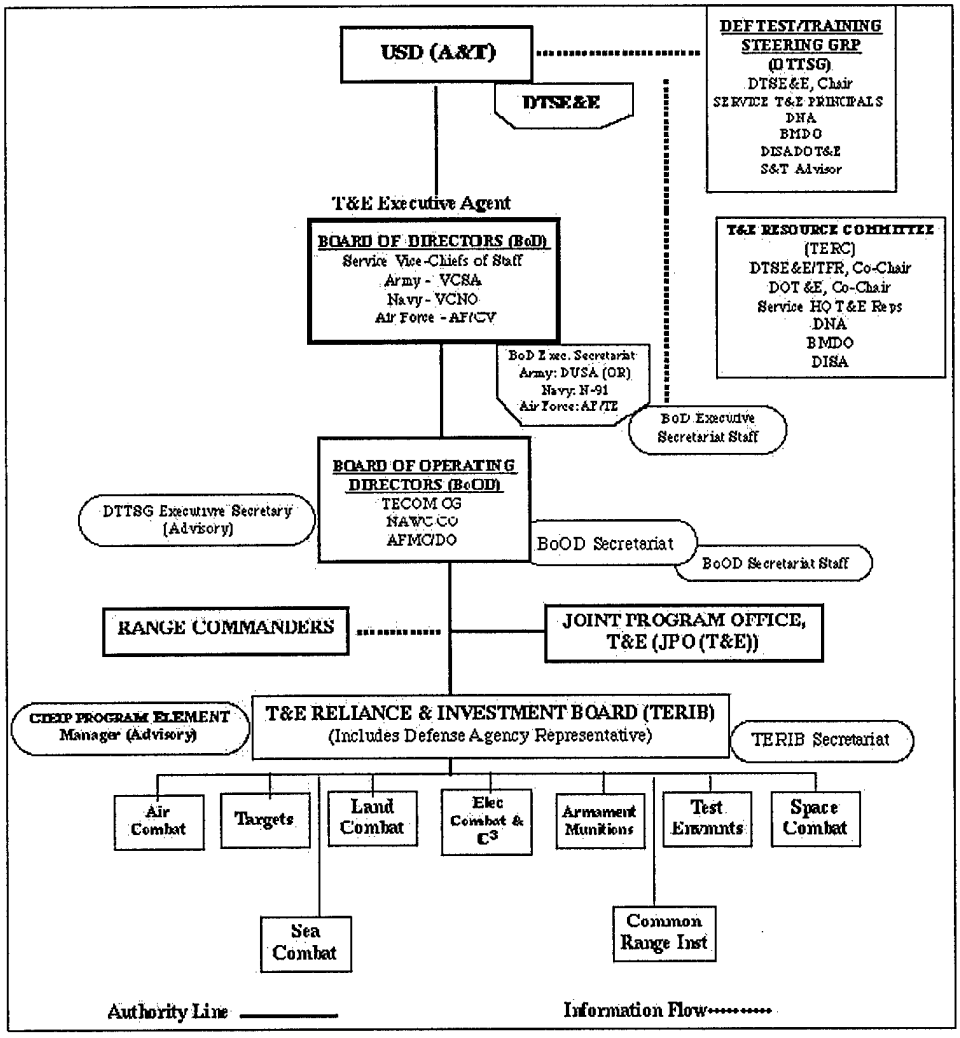

Figure 2. The T&E Executive Agent Structure

The 1994 BoD infrastructure study was a comprehensive review of the T&E infrastructure. The BoD determined that there were opportunities for consolidations, particularly in the electronic combat T&E area. The BoD included these consolidations in the Electronic Combat T&E Consolidation Master Plan for the

Secretary of Defense in response to a Congressional request to address electronic combat T&E. In addition, the BoD is moving toward implementation of consolidation and streamlining actions in the areas of supersonic sled tracks and outdoor radar cross section measurement facilities.

The 1995 BRAC JCSG(T&E) analyzed infrastructure in the T&E functional areas with the greatest potential for cross-servicing: air vehicles, armament/weapons, and electronic combat. However, they did not perform cost effectiveness, return on investment, or comprehensive operating analyses. Therefore the JCSG(T&E) alternatives, methodologies, and data provide a useful starting point for additional analysis, not a comprehensive set of recommendations.

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- **PLAN CONSIDERATIONS**

During BRAC 95, cross-Service opportunities were investigated through the mechanism of Joint Cross-Service Groups, including a group for T&E. Methodologies, criteria, and lessons learned will be employed as appropriate during the study phase of developing the plan for Vision 21. The plan will also account for changes in capability resulting from reengineering of business practices at the T&E centers to provide more responsive and less expensive support to T&E center users.

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- **REDUCTIONS AND RESTRUCTURING ACTIVITIES**

The T&E center infrastructure workforce is declining faster than the drivers of T&E support; i.e., RDT&E funding and the workload-related workforce. Figure 3 shows a normalized comparison of the trends since FY 1980 in RDT&E funding, MRTFB workload, and T&E infrastructure workforce. The T&E infrastructure workforce started its decline from a lower base, in that it did not share in the buildup of the 1980s. Further, the T&E center infrastructure, measured in terms of funding and personnel, accounts for less than 2% of the DoD infrastructure.

Figure 3 shows that although the Defense budget had significant increases in the 1980s the T&E infrastructure, as measured by the size of the workforce, had little growth and by FY 2001 it is programmed to be 39% below its FY 1980 level, in constant dollars. On the other hand RDT&E funding and T&E workload are programmed to be significantly above the FY 1980 level, even in real terms.

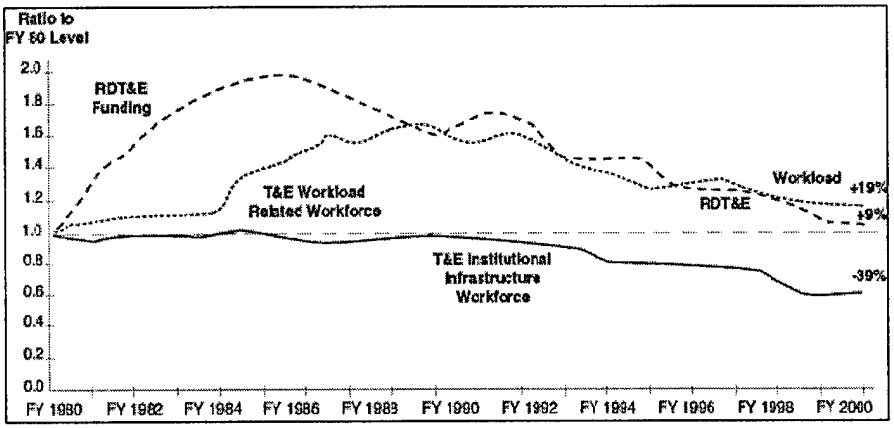

Figure 3. Trends in Major T&E Center (MRTFB) Infrastructure

The lack of appreciable growth in T&E during the 1980s (when defense had significant growth) combined with declines as the defense budget has declined has left a critical need for revitalization of the T&E infrastructure. Most T&E facilities were built in the early years of the cold war. More than two thirds of the T&E infrastructure is over thirty years old. During the last twenty years, the DoD's investment rate for the T&E facilities has been less than one third of the rate of investment in private industry and only about one sixth of the investment rate for high technology industries. The facilities need to be revitalized to:

- Address new technologies such as smart weapons, low observable systems, complex electronic systems, and space systems;
- Replace outdated technology and single Service approaches with state-of-the-art instrumentation and facilities that satisfy joint Service needs;
- Replace inefficient, labor intensive T&E capability with modern, cost effective instrumentation and facilities to meet the needs of the twenty-first century.

As previously noted, a number of major initiatives are ongoing that will result in significant reductions in DoD T&E personnel and infrastructure. It is therefore important that this study be based on an objective analysis of what DoD T&E facilities and programs will be required to maintain U.S. defense technological superiority into the 21st century.

Below are brief summaries of Army, Navy and Air Force BRAC and other T&E-related realignments, consolidations, and streamlining initiatives that are complete or will be completed by the end of FY 2001.

1. **Army**

   The Army has undertaken extensive efforts to reduce its T&E infrastructure. Base Realignment and Closure (BRAC) decisions, Defense Management Review Decisions, and Army internal consolidation efforts have all contributed to these reductions. The following paragraphs summarize the Army's efforts since 1989.

   a. **Test and Evaluation Command (TECOM).**

      In October 1989, the staffs of the Tropic Test Center and the Cold Regions Test Center were reduced.

      In June 1990, the Army implemented Defense Management Review Decision (DMRD) 936C. The following actions were accomplished: the Aviation Engineering Flight Activity at Edwards AFB, CA, was transferred from the Aviation Systems Command to TECOM; the Meteorological Teams were transferred from the Army Laboratory Command to TECOM; small missile testing was transferred from the Missile Command to TECOM's Redstone Technical Test Center (RTTC), AL; the small arms test facility at Fort Dix, NJ, was transferred to TECOM's Aberdeen Test Center (ATC), MD; and personnel consolidations at TECOM test facilities, and Headquarters TECOM were effected. Total savings by the end of FY 1995 were 667 personnel and a cost avoidance of $166M.

      The consolidations and savings achieved by the Army as part of DMRD 936C were accepted as Army input to DMRD 922, RDT&E Consolidation. In addition, the T&E Reliance portion of DMRD 922

established 17 working groups, each associated with a particular test functional area. The mission of the working groups was to designate a lead Service for each area to improve management, eliminate unnecessary duplication, and oversee T&E capital investments for that area. The Army is the lead for five areas, and has developed Test Capability Master Plans to implement improvements for these areas. Specific T&E Reliance accomplishments affecting the Army include the following: Marine Corps Light Armored Vehicle Testing and Management Organization was consolidated and transferred from Twenty Nine Palms, CA, to TECOM's Yuma Proving Ground (YPG), AZ; Navy underwater component shock testing was consolidated to TECOM's ATC; and the Electromagnetic Test Facilities at Kirtland AFB, NM, was realigned under TECOM's White Sands Missile Range (WSMR), NM.

As a result of the FY 1988 BRAC recommendation, TECOM's Jefferson Proving Ground (JPG), IN, was closed. The transfer of the JPG mission to YPG was completed in September 1994, and the closure of JPG was completed in September 1995.

In addition, other consolidations of TECOM's test ranges and activities included the following: the Cold Regions Test Activity was restructured as a Test Directorate of YPG in October 1994; the Tropic Testing mission was transferred from DPG to YPG in October 1994 to consolidate all environmental testing under YPG control; TECOM's Electronic Proving Ground (EPG), AZ, was discontinued as a separate test activity and was consolidated as a Test Directorate of WSMR; effective 1 October 1996, the Airworthiness Qualification Test Directorate of TECOM's Aviation Technical Test Center (ATTC), AL, will be transferred from Edwards AFB to Fort Rucker, AL; and effective 1 October 1996, base support at DPG is being reduced.

In summary, TECOM will have restructured itself from nine major test centers to six (Aberdeen Test Center, White Sands Missile Range, Dugway Proving Ground, Yuma Proving Ground, Redstone Technical Test Center, and Aviation Technical Test Center). In addition, through reorganization and efficiency measures, Headquarters TECOM will continue to reduce its manpower. Overall, beginning from FY 1990, TECOM will have reduced its manpower by 35%.

b. U.S. Army Kwajalein Atoll.

In FY 1993, test operations at the Army Kwajalein Atoll were reviewed by an assessment team with a goal of reducing the cost of operations by $40M by FY 1999. A series of 39 management initiatives were identified as the means to meet this goal. This goal was actually achieved by the end of FY 1995. The attainment of an additional goal of $15M in savings, initiated with 19 recommendations from an FY 1994 Study Team, is now 40% complete. Overall, beginning from FY 1990, Kwajalein Atoll will have reduced its test operation support personnel by 13%.

c. Operational Test and Evaluation.

In 1988, the operational evaluation mission for all nonmajor weapon systems was transferred from the Training and Doctrine Command (TRADOC) schools to the Operational Test and Evaluation Agency (OTEA). In addition, the entire operational testing mission was consolidated to the Test and Experimentation Command (TEXCOM) of

TRADOC. Also, an internal consolidation of all TEXCOM personnel from Fort Ord, CA, to Fort Hunter-Liggett, CA, was initiated and completed in 1990.

As a result of DMRD 936C, TEXCOM was combined with OTEA and the Operational Threat Support Activity (OTSA) to form the Operational Test and Evaluation Command (OPTEC).

As a result of the FY 1995 BRAC recommendation, the Test and Experimentation Center of TEXCOM was identified to be transferred from Fort Hunter-Liggett, CA, to Fort Bliss, TX. The executable time frame for the move is 1999.

In addition to the above efforts, OPTEC 2000, initiated in 1992 and expected to be completed in 1998, will realign and reduce personnel. Overall, beginning from FY 1990, OPTEC will have reduced its manpower by 45%.

2. Navy

The Navy is continuing to execute a long-established strategy to consolidate its technical activities into a combined RDT&E infrastructure. This strategy rests upon the Secretary of the Navy's (SECNAV) belief that the most efficient use of Navy laboratories and T&E center facilities and personnel is obtained through shared major resources.

Test and evaluation is integral to the laboratory efforts in all aspects of a weapon system's life cycle, from early research and technology development through retirement from service. This often requires that very complex and costly laboratory facilities be developed to deal with today's complex technologies. Therefore, instead of performing R&D and T&E work at different sites that have similar but separate support infrastructures, the Navy conducts R&D, T&E, and most In-Service Engineering for a program at a single site using the same facilities, equipment, manning, and support activities throughout the life of that program. For example, the Sea Range at NAWCWPNS is an MRTFB funded activity, but it is used by the entire RDT&E community for weapons and other systems development and technology research. It is also used extensively by the fleet for combined and separate exercises of air, surface and subsurface forces. In addition, it is used by other services. Efficiencies and subsequent cost savings from this strategy are realized due to:

- salary and benefit savings;
- savings in base operations;
- savings in acquisition program costs due to integrated facility utilization;
- synergistic relationships, creating a core cadre of experts who perform across the system's total life cycle, allowing for required technical support with fewer personnel.

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3. Air Force

a. Evolution to a Quality Core

Test and Evaluation (T&E) facilities in the Air Force are an outgrowth of a rich weapons systems research, development and acquisition history. From the early days at what is now Wright-Patterson AFB (WPAFB), OH, the T&E infrastructure has evolved to support the development of weapons systems necessary to protect national interests. The Air Force T&E theme has been, and is, one of restricting facility proliferation and consolidating or realigning to meet the mandates of fiscally constrained budgets and technological superiority.

As the potential for air power became better understood, the test requirements based on technological changes became more sophisticated and demanding. The weapons of air power demanded a focused approach to testing, so in the early 1940s the Air Force expanded from WPAFB, OH, to Valparaiso, FL (now Eglin AFB), for munitions development and testing. Similarly, as the potential for increased performance of the air frame was realized and understood, the demand for security, isolation, safety and uncrowded air space increased significantly. The Air Force expanded test operations to Muroc Dry Lake Bed, CA (now Edwards AFB), to satisfy these new requirements. After W.W.II, it was recognized that concentrated research and development of aerodynamic properties and propulsion was needed in sophisticated ground test simulation facilities, if the United States was to remain a leader in air power. Hence, Arnold Engineering Development Center, TN (AEDC), was established.

b. T&E (1960s through 1980s) -- Weapons, Electronics, and Improvements

From these early beginnings and in response to the Cold War, the need to test and evaluate supersonic aircraft technologies, associated munitions, and eventually space systems, required the Air Force to build specialized ground test facilities. As nuclear weapons and electronics became more a part of air power, two new locations for T&E were created. The Special Weapons Center (SWC) at Kirtland AFB, NM concentrated on the technologies supporting nuclear weapons development. Hanscom Field, MA concentrated on new levels of sophistication in electronics and avionics development. However, both locations were closed for testing in the late 1970s because the Air Force felt that limited R&D dollars were better spent on technology than on infrastructure. The Air Force also invested in Holloman AFB, NM, and the Army's White Sands Missile Range, NM, building a high speed sled track, a navigation/guidance test

facility, and radar cross section test capabilities; all requiring a specific seismic stability, isolation, and electronic quietness only found in this region. Space and ballistic missile testing requirements, to include polar and equatorial orbital options, created the need for both Patrick AFB, FL, and Vandenberg AFB, CA.

In the 1980s, Air Force concentration turned to test process improvements and again to reducing costs in support of drawing down the T&E infrastructure. With the SWC closing and reassignment of test aircraft from Hanscom AFB to WPAFB, reducing test support costs and improving test efficiencies were now paramount. Cost effective ground test facilities, reducing the need for expensive open air range testing, were developed at three primary Air Force test locations -- Arnold AFB, Edwards AFB, and Eglin AFB.

c. Further Air Force T&E Infrastructure Drawdown (1990s)

Today's Air Force T&E infrastructure exists at 3 centers and 1 operating location to support aircraft, munitions, electronic combat, C4I, and space systems development. AEDC at Arnold AFB, TN, and its ground-based mission simulation capabilities, supports aircraft, munitions, aerodynamics, and propulsion technologies. Also supported at AEDC is rocket propulsion, hypersonics, and space systems testing. The Air Force Flight Test Center (AFFTC) at Edwards AFB, CA (including management of the Air Force Electronic Warfare Evaluation Simulator (AFEWES) and the Real-Time Digitally Controlled Analyzer Processor (REDCAP) facilities, and the Nellis Range Complex electronic combat test capabilities) primarily supports aircraft, avionics, and electronic combat test and evaluation. The Air Force Development Test Center (AFDTC) at Eglin AFB, FL, and its 46th Test Group at Holloman AFB, NM, primarily supports munitions systems, C4I, guidance system, and radar cross-section measurement test and evaluation. These locations, having evolved over the past fifty years, represent a significant investment (over $18B replacement value) and contribute to the effective development of many DoD weapons systems.

With the end of the Cold War, the Air Force was faced with the need to reduce the T&E infrastructure costs even more. The Air Force had to carefully balance the need to reduce infrastructure costs; to preserve a disciplined test process; and to provide the required test capabilities and information in support of the acquisition process and the warfighter.

Keeping these challenges in mind, the Air Force made a number of internal management adjustments to its T&E infrastructure. One major decision that will have long-reaching effects is the merger of the Air Force Systems Command and the Air Force Logistics Command. With this merger, a major shift in acquisition management occurred that also affects T&E. As the technology base, program offices, logistics centers, T&E and the private sector teamed and merged their expertise as IPTs under the Integrated Weapon System Management (IWSM) concept, their T&E requirements have become more focused and unified - allowing for future T&E efficiencies. One immediate effect of this merger on T&E was the return of 15 test aircraft to Air Combat Command at an annual cost savings of over $3M and elimination of about 80 manpower positions. In addition, the Air Force closed the Nuclear Electromagnetic Radiation Test Facilities at Kirtland AFB, NM, and reduced its T&E aircraft inventory by approximately 50% and its 1995 manpower by 25% from its 1987 peak

year. In real terms, Air Force T&E infrastructure funding in FY95 was 18% less than in FY90. (It actually has experienced a negative growth in excess of 30% when measured from the early 1980s.)

BRAC 93 resulted in the dissolution of the 4950th Test Wing from WPAFB, and consolidation of its residual assets to Edwards AFB. Joint Service consolidations also played a major role in the early 1990s timeframe for the Air Force. The T&E Executive Agent decided in early 1995 to consolidate sled track testing operations to one location (Holloman AFB, NM) and consolidation of outdoor static Radar Cross Section (RCS) measuring facilities. BRAC 95 impacted Air Force T&E infrastructure by disestablishment of the Electromagnetic Test Environment (EMTE), the electronic warfare test range at AFDTC. Also affected was the closure of the REDCAP facility in Buffalo, NY, with required test activities and necessary support equipment relocating to the AFFTC. Finally under BRAC 95, all test range activity at UTTR was disestablished and management responsibility transferred to the Air Combat Command to support training.

Since the 1970s, Air Force T&E management has been aggressively pursuing T&E consolidations/realignments on its own and within the joint arena. Future concepts of A-76 studies, privatization and outsourcing are not new to Air Force T&E. The successful "privatizing" of AEDC proves that the Air Force is serious about consolidating and can effectively optimize the T&E infrastructure. Additional manpower and aircraft reductions are programmed as the Air Force continues downsizing its test and test support infrastructure. Projected manpower reductions will result in approximately a 35% reduction from our peak year. This evolution to a quality core Air Force T&E capability has been, and will continue to be the Air Force's mandate for the future.

4. Defense Agencies

Two DoD information systems test facilities have been merged through the consolidation of the Naval Telecommunications Systems Integration Center into the Joint Interoperability Test Center (JITC) at Fort Huachuca, AZ. As a result of this merger, JITC's MRTFB testing capabilities expanded to include naval telecommunications T&E of systems such as Common Digital Information Exchange System, Naval Modular Automated Communications System and Communications Data Processing System.

Between FY 1994 and FY 1996, the Defense Nuclear Agency (DNA) greatly reduced the infrastructure and number of employees at the Department of Energy's Nevada Test Site. The number of buildings maintained by DNA was reduced from 110 to five, and the number of contractor support personnel from 647 to fifteen. Government personnel were reduced from 85 to twelve.

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APPENDIX A

National Defense Authorization Act for Fiscal Year 1996, Section 277

SEC. 277. FIVE YEAR PLAN FOR CONSOLIDATION OF DEFENSE LABORATORIES AND TEST AND EVALUATION CENTER.

A. FIVE-YEAR PLAN

The Secretary of Defense, acting through the Vice Chief of Staff of the Army, the Vice Chief of Naval Operations, and the Vice Chief of Staff of the Air Force (in their roles as test and evaluation executive agent board of directors) shall develop a five year plan to consolidate and restructure the laboratories and test and evaluation centers of the Department of Defense.

B. OBJECTIVE

The plan shall set forth the specific actions needed to consolidate the laboratories and test and evaluation centers into as few laboratories and centers as is practical and possible, in the judgment of the Secretary, by 1 October 2005.

C. PREVIOUSLY DEVELOPED DATA REQUIRED TO BE USED

In developing the plan, the Secretary shall use the following:

1. Data and results obtained by the Test and Evaluation Joint Cross-Service Group and the Laboratory Joint Cross-Service Group in developing recommendations for the 1995 report of the Defense Base Closure and Realignment Commission.

2. The report dated March 1994 on the consolidation and streamlining of the test and evaluation infrastructure, commissioned by the test and evaluation board of directors, along with all supporting data and reports.

D. MATTERS TO BE CONSIDERED

In developing the plan, the Secretary shall consider, at a minimum, the following:

1. Consolidation of common support functions, including the following:

- Aircraft (fixed wing and rotary) support
- Weapons support
- Space systems support
- Support of command, control, communications, computers, and intelligence.

2. The extent to which any military construction, acquisition of equipment, or modernization of equipment is planned at the laboratories and centers.

3. The encroachment on the laboratories and centers by residential and industrial expansion.

4. The total cost to the Federal Government of continuing to operate the laboratories and centers.

5. The cost savings and program effectiveness of locating laboratories and centers at the same sites.

6. Any loss of expertise resulting from the consolidations.

7. Whether any legislation is necessary to provide the Secretary with any additional authority necessary to accomplish the downsizing and consolidation of the laboratories and centers.

E. REPORT

Not later than May 1, 1996, the Secretary of Defense shall submit to the congressional defense committees a report on the plan. The report shall include an identification of any additional legislation that the Secretary considers necessary in order for the Secretary to accomplish the downsizing and consolidation of the laboratories and centers.

F. LIMITATION

Of the amounts appropriated or otherwise made available pursuant to an authorization of appropriations in section 201 for the central test and evaluation investment development program, not more than 75 percent may be obligated before the report required by subsection (e) is submitted to Congress.

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APPENDIX B

National Defense Authorization Act for Fiscal Year 1996, Section 265

SEC. 265. AERONAUTICAL RESEARCH AND TEST CAPABILITIES ASSESSMENT.

A. FINDINGS

Congress finds the following:

1. It is in the Nation's long-term national security interests for the United States to maintain preeminence in the area of aeronautical research and test capabilities.

2. Continued advances in aeronautical science and engineering are critical to sustaining the strategic and tactical air superiority of the United States and coalition forces, as well as United States economic security and international aerospace leadership.

3. It is in the national security and economic interests of the United States and the budgetary interests of the Department of Defense for the department to encourage the establishment of active partnerships between the department and other Government agencies, academic institutions, and private industry to develop, maintain, and enhance aeronautical research and test capabilities.

B. REVIEW

The Secretary of Defense shall conduct a comprehensive review of the aeronautical research and test facilities and capabilities of the United States in order to assess the current condition of such facilities and capabilities.

C. REPORT

1. Not later than March 1, 1996, the Secretary of Defense shall submit to the congressional defense committees a report setting forth in detail the findings of the review required by subsection (b).

2. The report shall include the following:

   a. The options for providing affordable, operable, reliable, and responsive

long-term aeronautical research and test capabilities for military and civilian purposes and for the organization and conduct of such capabilities within the Department or through shared operations with other Government agencies, academic institutions, and private industry.

b. The projected costs of such options, including cost of acquisition and technical and financial arrangements (including the use of Government facilities for reimbursable private use).

c. Recommendations on the most efficient and economic means of developing, maintaining, and continually modernizing aeronautical research and test capabilities to meet current, planned, and prospective military and civilian needs.

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APPENDIX C

NATIONAL SCIENCE AND TECHNOLOGY COUNCIL (NSTC) STUDY

This Appendix contains pertinent portions of the NSTC Interagency Federal Laboratory Review Final Report, dated May 15, 1995.

Federal Laboratory Reform

On May 5, 1994, President Clinton requested the NSTC to review the Federal laboratories operated by the Department of Defense, the Department of Energy, and the National Aeronautics and Space Administration. The NSTC completed its report to the President May 15, 1995.

Based on that report, the President has concluded that the laboratory systems of the Department of Defense, the Department of Energy, and the National Aeronautics and Space Administration provide essential services to the Nation in fundamental science, national security, environmental protection, energy, aerospace, and technologies that contribute to industrial competitiveness.

It is imperative that the national investment in these resources be used in the most efficient and effective manner possible. On the basis of the Vice President's National Performance Review, and of the National Science and Technology Council Interagency Federal Laboratory Review, much has been done in implementing reforms in management of the Nation's three largest laboratory systems. To ensure the best management and return on Federal expenditure, the President has provided further guidance to the heads of Agencies for implementation of management reforms within the federal laboratory system.

The United States will improve agency management and reduce unnecessary redundancy in the laboratory systems of the Department of Defense, the Department of Energy, and the National Aeronautics and Space Administration, while maintaining the laboratories' quality and ability to contribute to national needs.

In implementing reforms of the federal laboratory system, agencies will adhere to the following general guidelines and principles:

1. Agencies will review and, as appropriate, rescind, internal management instructions, regulations, and redundant oversight that impede laboratory performance.

2. Agencies will clarify and focus mission assignments for their laboratories, eliminating redundancy and restructuring the laboratory systems as appropriate and necessary.

3. In their efforts to achieve greater efficiency and effectiveness in their laboratory systems, agencies will first seek to achieve all possible savings through streamlining and improving management. Then, as necessary, they will reduce or eliminate lower priority programs, in accordance with guidance from the Office of Management and Budget and the Office of Science and Technology Policy, based on priorities set by the National Science and Technology Council and, as appropriate, the National Security Council.

4. Agencies will continue to explore opportunities to coordinate and integrate laboratory resources and facilities on an interagency and inter-service basis, eliminating unnecessary duplication and establishing joint management where appropriate.

Findings Pertinent to DoD Laboratories

DoD's guidance for Round Three of the BRAC process emphasized the importance of cross-service integration and maximum use of common support assets. Opportunities for cross-service integration within DoD laboratories are greatest in areas where each of the services has both requirements and existing laboratory programs. The most promising areas are: biomedical R&D, energetics (explosives, propellants, and pyrotechnics), C4I, and common facilities in all aspects of research, development, testing, and evaluation for aircraft and air-to-air and air-to-ground weapons.

DoD's BRAC 95 recommendations made only limited progress toward the goal of cross-service integration. The most significant change was the decision to form the tri-service Armed Forces Medical Research and Development Agency. In addition, a degree of cross-service integration will be achieved in the closure of the Air Force's Rome Laboratory in New York State, by moving some electronics, computer, and communications work, with staff, to the Army's Fort Monmouth facility in New Jersey. Significant proposals for cross-service integration in the other areas, however, were lacking in the BRAC recommendations.

DoD's recommendations for closing labs were on the whole modest. The Air Force proposed moving two labs and consolidating components of each, with consequent savings in operations costs, but would retain and transfer most of the positions. The Army's proposal would reduce some administrative positions, but would neither close any labs nor remove any lab staff. The Navy, which has the largest lab structure, proposed the most considerable changes, recommending the closure of a number of facilities and substantial reduction of lab staff positions.

Although DoD did not take the opportunity provided by BRAC to integrate more functions across the services, achieving integration by other routes is a possibility for the future. Downsizing of DoD labs is a necessity, because of declining budgets and reduced mission demands resulting from fewer acquisitions, and because of the Department's obligations to reduce staff, as part of the reduction in federal employment mandated by the President and by law. In line with the mandate for personnel reduction, the military departments are planning to cut lab staff (Full Time Equivalent, or FTE) by 35 percent from 1994 through 2001. The greater efficiency achieved through cross-service integration will be necessary to continue meeting mission requirements while budgets and the size of the lab staff shrink.

In forwarding BRAC 95 recommendations, Secretary of Defense William Perry said: "Overall, the cross service effort did assist in reducing capacity and determining where joint or collocated functions made functional or economic sense. Further, this DoD-wide review of support functions provides a road map for cross-servicing in the future."

Recommendation Pertinent to DoD

DoD will submit a report to the President by February 15, 1996 detailing plans for schedules for downsizing the DoD laboratories, including identification of opportunities for greater efficiency through measure such as cross-service integration and service lab consolidations.

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Statement by the President

25 September 1995

Future of Major Federal Laboratories

On May 5, 1994, I directed the Department of Defense, the Department of Energy, and the National Aeronautics and Space Administration to review their major laboratories. These three laboratory systems account for approximately one-fifth of the Federal investment in research and development (R&D) -- approximately $15 billion out of a total of about $70 billion. I sought a study that would assess the continuing value of these laboratories in serving vital public needs, and I wanted an evaluation of options for change within these labs for the purpose of cutting costs and improving R&D productivity.

Informed by that review, I am announcing today an initial set of directives which will affect these laboratories well into the future.

I have concluded that these laboratories provide essential services to the Nation in fundamental sciences, national security, environmental protection and cleanup, and industrial competitiveness. Many of these laboratories are equipped with research tools that are among the finest in the world. They employ personnel with extraordinary, and in many cases irreplaceable, talent. These labs have contributed greatly to our Nation in the past, and hold the potential for contributions of tremendous importance in the future.

One example where the National laboratories can help change the course of history is with respect to nuclear weapons. On August 11, 1995, I announced my decision to seek a "zero" yield Comprehensive Test Ban Treaty (CTBT). I was able to make that decision based on assurances by the Secretary of Energy and the Directors of the Department of Energy's nuclear weapons labs that we can meet the challenge of maintaining our nuclear deterrent under a CTBT through a Science-Based Stockpile Stewardship program without nuclear testing.

To meet the challenge of ensuring confidence in the safety and reliability of our stockpile, I have concluded that the continued vitality of all three DoE nuclear weapons laboratories will be essential.

In accordance with this conclusion, I have directed the Department of Energy to maintain nuclear weapons responsibilities and capabilities adequate to support the science-based

stockpile stewardship program required to ensure continued confidence in the safety and reliability of the nuclear-weapons stockpile in the absence of nuclear testing. Stable funding for this effort based on bipartisan support will be necessary in order to meet this requirement.

Strong bipartisan support equally is necessary across a broad range of other science and technology programs being performed in Federal laboratories, academia, and the private sector. Since the beginning of my Administration, we have placed a high priority on investments in science and technology. We believe that few areas of Federal spending will be more important to the well-being of future generations than R&D. We are deeply concerned about budget actions that could cripple our capacity to find new ways of solving the scientific and technological challenges of the 21st century.

Among our greatest strengths as our Nation moves into the next century will be our ability to innovate -- to design new drugs, to find new ways to enhance our national security, to develop new tools for managing enormous amounts of information, to generate new ways of harnessing energy, to produce new materials and processes that result in new products and industries at lower cost and with less pollution, and to expand the frontiers of our knowledge of the universe. These laboratories have excelled in such innovations as these, and will continue to yield great public dividends for our Federal investment.

At the same time, these labs must be run as efficiently as possible. I have directed the Agencies to review and, as appropriate, to rescind internal management instructions and oversight that impede laboratory performance. I have directed the Agencies to clarify and focus the mission assignments of their laboratories. I also have directed the Agencies to achieve all possible budget savings through streamlining and management improvements before productive R&D programs are sacrificed. Many Agencies and laboratories already are making important progress in each of these areas of management reform.

It has been said that R&D investments are an expression of our confidence as a Nation in our future. Today we are reaping the benefits of those who wisely invested in Federal R&D in the past. While it would be easy to destroy premier Federal laboratories through severe budget cuts or senseless closures, that is not a path that this Administration will follow. We will invest in our Federal laboratories, while pursing aggressive management reforms that ensure the maximum productive output for the taxpayers' investments.

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DoD LABORATORIES TO BE CONSIDERED FOR *VISION 21*

Office of the Secretary of Defense

1. Armed Forces Radiological Research Institute, Bethesda, MD

Army

1. Army Research Lab, Adelphi, MD
2. Army Research Lab, Aberdeen Proving Ground, MD
3. Army Research Lab, White Sands Missile Range, NM
4. Army Research Lab, NASA, Langley, VA
5. Army Research Lab, NASA, Lewis, OH
6. Natick Research, Development and Engineering Center, Natick, MA
7. Aviation Research, Development and Engineering Center, St. Louis, MO
8. Aviation Troop Command, Aeroflight Dynamics Directorate, Moffett Field, CA
9. Aviation Troop Command, Aviation Applied Technology Directorate, Fort Eustis, VA
10. Edgewood Research, Development and Engineering Center, Aberdeen Proving Ground, MD
11. Communications Electronics Command Research, Development and Engineering Center, Ft. Monmouth, NJ
12. Communication Electronics Command Research, Development and Engineering Center-Night Vision Electro-Optics Directorate, Ft. Belvoir, VA
13. Missile Research, Development and Engineering Center, Redstone Arsenal, AL
14. Armaments Research, Development and Engineering Center, Picatinny Arsenal, NJ
15. Armaments Research, Development and Engineering Center, Benet Labs, Watervliet Arsenal, NY
16. Tank-Automotive Command Research, Development and Engineering Center, Warren, MI
17. USA Research Institute of Infectious Diseases, Ft. Detrick, MD
18. Walter Reed Army Institute of Research, Washington, DC
19. Institute of Surgical Research, Ft. Sam Houston, TX
20. Aeromedical Research Lab, Ft. Rucker, AL
21. Medical Research Institute of Chemical Defense, Aberdeen Proving Ground, MD
22. Research Institute of Environmental Medicine, Natick, MA
23. Construction Engineering Research Laboratory, Champaign, IL
24. Cold Regions Research and Engineering Lab, Hanover, NH
25. Topographic Engineering Center, Alexandria, VA

26. Waterways Experiment Station, Vicksburg, MS
27. Research Institute for Behavioral & Social Sciences, Alexandria, VA
28. Simulation, Training and Instrumentation Command, Orlando, FL
29. *High Energy Laser Systems Test Facility, White Sands Missile Range, NM

Navy

1. Naval Air Warfare Center, Weapons Division, China Lake, CA
2. Naval Air Warfare Center, Weapons Division, Point Mugu, CA
3. Naval Air Warfare Center, Aircraft Division, Patuxent River, MD
4. Naval Air Warfare Center, Aircraft Division, Lakehurst, NJ
5. Naval Research Lab, Washington, DC
6. Naval Research Lab Detachment, Bay St. Louis, MS
7. Naval Surface Warfare Center, Carderock Division, Bethesda, MD
8. Naval Surface Warfare Center, Crane Division, Crane, IN
9. Naval Surface Warfare Center, Dahlgren Division, VA
10. Naval Surface Warfare Center, Dahlgren Detachment, Panama City, FL
11. Naval Surface Warfare Center, Indian Head Division, VA
12. Naval Surface Warfare Center, Port Hueneme Division, Port Hueneme, CA
13. Naval Surface Warfare Center, Bayview, ID
14. Naval Command, Control, and Ocean Surveillance Center, San Diego, CA
15. Naval Command, Control, and Ocean Surveillance Center, In-Service Engineering Division, Charleston, SC
16. Naval Command, Control, and Ocean Surveillance Center In-Service Engineering Division, Pearl Harbor, HI
17. Naval Aerospace Medical Research Center, Pensacola, FL
18. Naval Dental Research Lab, Great Lakes, IL
19. Naval Health Research Center, San Diego, CA
20. Naval Undersea Warfare Center, Keyport Division, Keyport, WA
21. Naval Surface Warfare Center, Carderock Division, Philadelphia Det., Philadelphia, PA
22. Naval Undersea Warfare Center, Newport, RI
23. Naval Research Lab, Monterey Det., Monterey, CA
24. *Naval Air Systems Command (engineering functions)
25. *Naval Sea Systems Command (engineering functions)
26. *Naval Air Warfare Center Training Systems Division, Orlando, FL
27. *Naval Clothing and Textile Research Facility, Natick, MA
28. *Naval Facilities Engineering Service Center, Port Hueneme, CA
29. *Naval Submarine Medical Research Laboratory, Groton, CT
30. AEGIS, Wallops Island, VA
31. AEGIS, Morrestown, NJ
32. Naval Warfare Assessment Division, Corona, CA
33. Explosive Ordnance Disposal Technical Center, Indian Head, MD
34. Naval Ordnance Center, Indian Head, MD
35. Naval Sea Logistics Center, Mechanicsburg, PA
36. Fleet Technical Support Center, Mayport, FL
37. Fleet Technical Support Center, San Diego, CA
38. Fleet Technical Support Center, Pearl Harbor, HI

Air Force

1. Armstrong Lab, Brooks AFB, TX
2. Armstrong Lab, Wright-Patterson AFB, OH
3. Armstrong Lab, Mesa, AZ
4. Human Systems Center, Brooks AFB, TX (engineering functions)
5. Wright Lab, Wright-Patterson AFB, OH
6. Wright Lab, Eglin AFB, FL
7. Wright Lab, Tyndall AFB, FL

8. Aeronautical Systems Center, Wright-Patterson AFB, OH (engineering functions)
9. Aeronautical Systems Center, Eglin AFB, FL (engineering functions)
10. Oklahoma City Air Logistics Center, Tinker AFB, OK (nondepot-related engineering functions)
11. Ogden Air Logistics Center, Hill AFB, UT (nondepot-related engineering functions)
12. Warner-Robins Air Logistics Center, Robins AFB, GA (nondepot-related engineering functions)
13. Phillips Lab, Kirtland AFB, NM
14. Phillips Lab, Hanscom AFB, MA
15. Phillips Lab, Edwards AFB, CA
16. Space & Missile Center, Los Angeles AFB, CA (engineering functions)
17. Rome Lab, Griffiss AFB, Rome, NY
18. Rome Lab, Hanscom AFB, MA
19. Electronic Systems Center, Hanscom AFB, MA (engineering functions)

****Defense Advanced Research Projects Agency**

****Defense Nuclear Agency**

****Defense Logistics Agency**

****Ballistic Missile Defense Organization**

****Defense Information Systems Agency**

****Armed Forces Radiobiology Research Institute**

* Additional site to what Lab Joint Cross-Service Group considered in BRAC 95

** Only those functions/activities that conform to the definition of a laboratory in section I, part C.2, if any, will be considered in the laboratory consolidation study.

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DoD TEST AND EVALUATION CENTERS TO BE CONSIDERED FOR *VISION 21*

Army

1. Aberdeen Test Center, Aberdeen Proving Ground, MD
2. Redstone Technical Test Center, Redstone Arsenal, AL
3. White Sands Missile Range, NM
4. Yuma Proving Ground, AZ
5. Dugway Proving Ground, UT
6. Aviation Technical Test Center, Ft. Rucker, AL
7. *Kwajalein Atoll
8. *Test and Experimentation Command, Ft. Hood, TX
9. *TEXCOM Experimentation Center, Ft. Bliss, TX
10. *Operational Threat Support Activity
11. Yuma Proving Ground, Cold Regions Test Center, Fort Greely, AK
12. Yuma Proving Ground, Tropic Test Activity, Panama
13. White Sands Missile Range, Electronic Proving Ground, Fort Huachuca, AZ

Navy

1. Naval Air Warfare Center, Weapons Division, China Lake, CA
2. Naval Air Warfare Center, Weapons Division, Point Mugu, CA
3. Naval Air Warfare Center, Aircraft Division, Patuxent River, MD
4. Naval Air Warfare Center, Aircraft Division, Lakehurst, NJ
5. *Naval Research Lab, Washington, DC
6. *Naval Surface Warfare Center, Carderock Division, Bethesda, MD
7. Naval Surface Warfare Center, Crane Division, Crane, IN
8. Naval Surface Warfare Center, Dahlgren Division, VA
9. Naval Surface Warfare Center, Dahlgren Detachment, Panama City, FL
10. Naval Surface Warfare Center, Indian Head Division, VA
11. *Naval Surface Warfare Center, Port Hueneme Division, Port Hueneme, CA
12. *Naval Command, Control, and Ocean Surveillance Center, San Diego, CA
13. *Naval Command, Control, and Ocean Surveillance Center, In-Service Engineering Division, Charleston, SC
14. *Naval Undersea Warfare Center, Keyport Division, Keyport, WA
15. *Naval Surface Warfare Center, Carderock Division, Philadelphia Det., Philadelphia, PA
16. *Naval Undersea Warfare Center, Newport, RI
17. *Pacific Missile Range Facility, Kauai, HI

18. *Atlantic Fleet Weapons Training Facility, Naval Station Roosevelt Roads, PR

Air Force

1. Air Force Flight Test Center, Edwards AFB, CA
2. 476th Weapons Effectiveness Group, Tyndall AFB, FL
3. Air Force Development Test Center, Eglin AFB, FL
4. Utah Test and Training Range, Hill AFB, UT
5. Air Force Flight Test Center (AFEWES), Ft. Worth, TX
6. Arnold Engineering Development Center, Arnold AFS, TN
7. 46th Test Group, Holloman AFB, NM
8. Nellis Range Complex, Nellis AFB, NV
9. *30th Space Wing, Vandenberg AFB, CA
10. *45th Space Wing, Patrick AFB, CA
11. *Air Reserve Air Guard Test Center, Tucson, AZ

Defense Nuclear Agency

1. *GREENFARM, NAS Miramar, CA
2. *THUNDERBOLT, Milipitas, CA
3. *DECADE, Arnold AFS, TN
4. *Tonapah Test Range, Tonapah, NV
5. *Thermal Radiation Simulator, Kirtland AFB, NM
6. *Advanced Research Electromagnetic Simulator, Kirtland AFB, NM
7. *PI X-Ray Simulator (DOUBLE EAGLE), San Leandro, CA
8. *X-Ray Simulator (PITHON), San Leandro, CA
9. *BLACKJACK 5, San Diego, CA

Defense Information Support Agency

1. *Joint Interoperability Test Center, Ft. Huachuca, AZ

Ballistic Missile Defense Organization

1. *National Testbed Facility, Falcon AFB, CO

Defense Evaluation Support Activity

1. *Kirtland AFB, NM

* Additional site to what Lab Joint Cross-Service Group considered in BRAC 95

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APPENDIX G

CLOSURES AND REALIGNMENTS UNDER THE BASE REALIGNMENT AND CLOSURE PROCESS (FY 1989-2001)

ARMY

SITES TO BE CLOSED

Aviation-Troop Support Command, St. Louis, MO
Jefferson Proving Ground, Madison, IN
Vint Hill Farms Station, Vint Hill Farms, VA

OTHER ACTIVITIES CLOSED OR TO BE CLOSED AT HOST SITES

Material Technology Lab, Watertown, MA
Belvoir Research & Development Center, Fort Belvoir, VA
Harry Diamond Lab, Woodbridge, VA
Human Engineering Lab, Aberdeen Proving Ground, MD
Atmospheric Sciences Lab, White Sands Missile Range, NM
Vulnerability Assessment Lab, White Sands Missile Range, NM
Electronics Technology and Devices Lab, Ft. Monmouth, NJ
Biomedical Research Development Lab, Fort Detrick, MD
Letterman Army Institute of Research, Presidio, CA
Institute of Dental Research, Washington, D.C.
TEXCOM Experimentation Center, Fort Hunter-Liggett, CA

NAVY

SITES CLOSED

Salton Sea Test Range, El Centro, CA
Naval Civil Engineering Lab, Port Hueneme, CA
Naval Sea Combat Systems Engineering Support, Norfolk, VA
Naval Air Warfare Center, Trenton, NJ
Naval Surface Warfare Center, White Oak, MD
Naval Air Warfare Center, Warminister, PA
Naval Underwater Sound Reference Lab, Orlando, FL

Open Water Test Facility, Oreland PA
Naval Undersea Warfare Center, New London, CT
Naval Surface Warfare Center, Louisville, KY
Naval Air Warfare Center, Indianapolis, IN
Naval Management Systems Software Office, Chesapeake, VA
Naval Surface Warfare Center, Annapolis, MD

OTHER ACTIVITIES CLOSED AT HOST SITES

Naval Electronic Security Systems Engineering Center, Washington, DC
Naval Sea Automated Data Software Activity, Indian Head, MD
Naval Surface Warfare Center, Yorktown, VA
Naval Aviation Technical Services Facility, Philadelphia, PA
Naval Aviation Engineering Support Unit, Philadelphia, PA
Naval Medical Research Institute, Bethesda, MD
Naval Biodynamics Lab, New Orleans, LA
Naval Personnel Research and Development Center, San Diego, CA
Nuclear Weapons Evaluation Facility, Albuquerque, NM
Naval C4 In-Service Engineering Center, Norfolk, VA
Naval C4 In-Service Engineering Center, San Diego, CA
Integrated Combat Systems Test Facility, San Diego, CA
Naval Mine Warfare Engineering Activity, Yorktown, VA
Naval Electronic Systems Engineering Center, Vallejo, CA
TRIDENT Combat Control Systems Management Act., Newport, RI
Naval Ocean Systems Center Det. Kaneohe, HI
Naval Space Systems Activity, Los Angeles, CA
Fleet Combat Direction Systems Support Activity, San Diego CA
Naval Aviation Maintenance Office, Patuxent River, MD
Naval Aviation Depot Operations Center, Patuxent River, MD
Naval Sea Logistics Center, Mechanicsburg, PA
Naval Surface Warfare Center Det, Va. Beach, VA
Submarine Maint. Engineering Plan. Procure. Act., Portsmouth, NH
Planning, Estimating, Repair, Alterations, Headquarters, Norfolk, VA
Planning, Estimating, Repair, Alterations, Atlantic, Norfolk, VA
Planning, Estimating, Repair, Alterations, Pacific, Hunters Point, CA
Planning, Estimating, Repair, Alterations, CV, Bremerton, WA

AIR FORCE

SITES CLOSED

Air Force Guidance and Metrology Center, Newark AFS, OH
Sacramento Air Logistics Center, McClellan AFB, CA
Real-Time Digitally Controlled Analyzer Processor (REDCAP), Buffalo, NY

OTHER ACTIVITIES CLOSED AT HOST SITES

Sacramento Air Logistics Center, Peterson AFB, CO
San Antonio Air Logistics Center, Kelly AFB, TX
Ballistic Missile Organization, Norton AFB, CA
4950th Test Wing, Wright-Patterson AFB, OH
Electromagnetic Test Environment (EMTE), Eglin AFB, FL

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APPENDIX H

S&T RELIANCE AND THE DTAP PROCESS

By 1989, senior officials at the Department of Defense had become increasingly concerned about the viability of maintaining a "business-as-usual" approach to Science and Technology development in Defense Technology Base programs. In October 1989, the Deputy Secretary of Defense issued a draft of Defense Management Report Decision 922 (DMRD 922), which challenged the Services to create a new approach to S&T management that would increase efficiency and reduce unwarranted overlap in the Research, Development, Test and Evaluation activities of the Services.

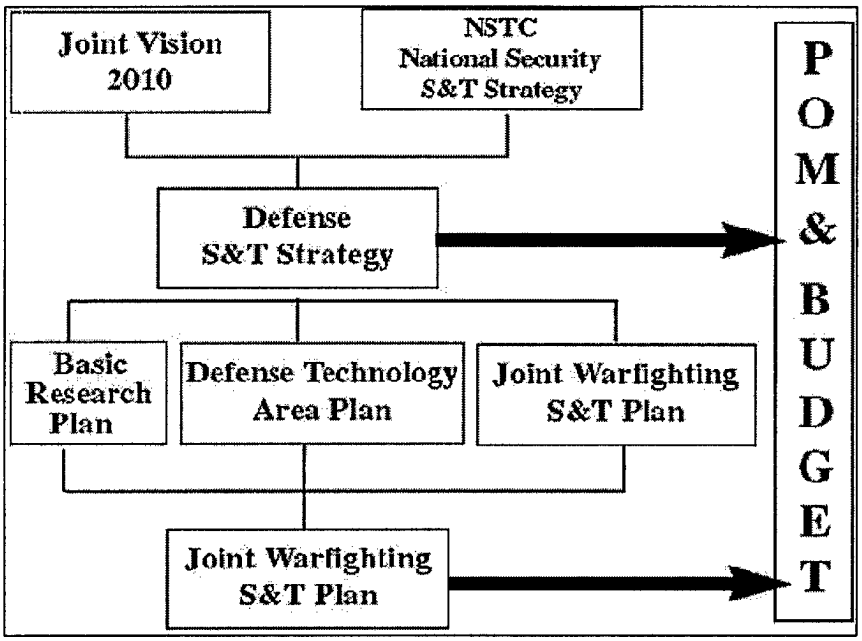
The Services moved quickly to respond to the challenges of the draft DMRD 922. In October 1989, just after issuance of the draft Decision, the Services began formal discussions on ways to further strengthen inter-Service cooperation in their RDT&E programs and increase the use of each other's facilities. One of these studies was called "Project Reliance," which was undertaken by the Army and Air Force to examine opportunities to consolidate and collocate their R&D efforts at single-site locations in selected technology areas. Project Reliance was ultimately expanded to include the Navy and became **Tri-Service S&T Reliance**—one of the most comprehensive restructuring efforts of Technology Base programs in over 40 years. (The Services also initiated intra-Service laboratory consolidation studies, i.e., the Army's Lab 21, the Navy's consolidation of its technical infrastructure into four Warfare Centers and a single Corporate Research Laboratory, and the Air Force's consolidation of its laboratories into four "Super Labs." The closure and realignment actions associated with these laboratory consolidation actions ultimately were forwarded by the Secretary of Defense to the Defense Base Closure and Realignment Commission on 12 April 1991, and became part of BRAC 91.)

By the summer of 1990, the three Services had jointly developed a coordinated proposal for the Deputy Secretary of Defense that further outlined approaches to RDT&E laboratory consolidation and inter-Service Reliance in both S&T and T&E. The DEPSECDEF approved the Tri-Service-coordinated proposal in concept, and the Services tasked individual groups to identify ways to achieve laboratory consolidation within the Services and achieve greater inter-Service Reliance for S&T and T&E. On 12 October 1990, the formal Tri-Service S&T Reliance study began and addressed the full range of the Services' S&T activities, namely their 6.1, 6.2, and 6.3A programs.

In November 1990, the DEPSECDEF signed the final version of DMRD 922, which formally endorsed the inter-Service Reliance initiative, acknowledged the savings already achieved by the individual Service consolidation initiatives, and tasked the Services to proceed with plans for further restructuring and streamlining their RDT&E activities.

In 1995, S&T Reliance began to evolve into a more comprehensive process. The Director,

Defense Research and Engineering assumed responsibility for management and formed a new strategic planning process for the entire S&T Program. The foundation of this process is the Defense S&T Strategy, which along with its supporting Basic Research Plan, Joint Warfighting S&T Plan, and Technology Area Plan, present the DoD S&T vision, strategy, plan, and objectives for planners, programmers, and performers of Defense S&T. Revised annually, these documents are a collaborative product of the Office of the Secretary of Defense, Joint Staff, Military Services, and Defense Agencies. The Strategy and Plans are fully responsive to the Chairman of the Joint Chief of Staff's Vision and Joint Vision 2010, and the White House National Security S&T Strategy, as shown in Figure H-1. The Strategy and Plans and supporting individual S&T Master Plans of the Military Services and Defense Agencies guide the annual preparation of the Defense program and budget. The S&T Strategy and associated plans are made available to the United States Government, Defense contractors, and U.S. allies with the goal of better focusing their collective efforts on superior joint warfare capabilities and enhanced interoperability between the United States and its allies.



H-1. Strategy and Plans

The Basic Research Plan (BRP) presents the DoD objectives and investment strategy for DoD-sponsored research performed by universities, industry, and Service laboratories. In addition to presenting the planned investment in 12 broad research areas, the FY96 plan highlights ten strategic research objectives holding great promise for enabling the development of breakthrough technologies for revolutionary 21st Century military capabilities.

The Joint Warfighting S&T Plan (JWP) takes a joint perspective horizontally across the Service and Defense Agencies to ensure support for the requisite technology and advanced concepts for superior joint and coalition warfighting. It ensures that the near-, mid-, and long-term needs of the joint warfighters are properly balanced and supported in the S&T planning, programming, budgeting, and assessment activities of the DoD. The JWP is focused around 12 Joint Warfighting Capability Objectives. These objectives support the five future military capabilities validated by the Joint Requirements Oversight Council (JROC), and the Joint Warfighting Capabilities Assessment (JWCA) as well as Joint Vision 2010. A significant feature of the JWP is the identification of mechanisms for the timely transition of technology to the warfighter in the field before it becomes obsolete or is found in the hands of our adversaries.

The Defense Technology Area Plan (DTAP) presents the DoD investment strategy for

technologies critical to DoD acquisition plans and the Joint Warfighting S&T Plan. The DTAP takes a horizontal perspective across Service and Defense Agency efforts, thereby charting the total DoD investment for a given technology. The anticipated return on investment is identified through some 200 Defense Technology Objectives (DTO) in ten broad technology areas. These DTOs identify the specific technology advancements that will be developed and/or demonstrated, the date of expected technology availability, and the specific military benefits resulting from the technology advance. Issued annually as Defense Guidance, the DTAP identifies the advanced concepts and technologies that are essential to enhancing high-priority joint warfighting needs and that will receive funding priority in the President's Budget and accompanying Future Years Defense Plan (FYDP). The ten technology areas under the DTAP process are as follows:

Air Platforms	Chemical, Biological Defense and Nuclear
Materials/Processes	Ground Vehicles and Watercraft
Space Platforms	Information Systems and Technology
Weapons	Sensors and Electronics
Human Systems	Medical and Biomedical

Figure H-2 shows a flow chart of the S&T Reliance process. It includes an assessment of the ten technology areas by an independent assessment group, the Technology Area Review and Assessment (TARA), composed of senior, non-DoD engineers and scientists, as well as selected OSD personnel. The purpose of this review is to assess the integration of programs, reduce unnecessary duplication, and recommend opportunities for improved synchronization and synergy. Issues that cannot be resolved within the Reliance area are raised to the Defense S&T Advisor Group (DSTAG). The results of the TAP/TARA processes form the input to the Services investment strategies along with supplemental S&T requirements guidance, such as the Navy's S&T Requirements Guidance.

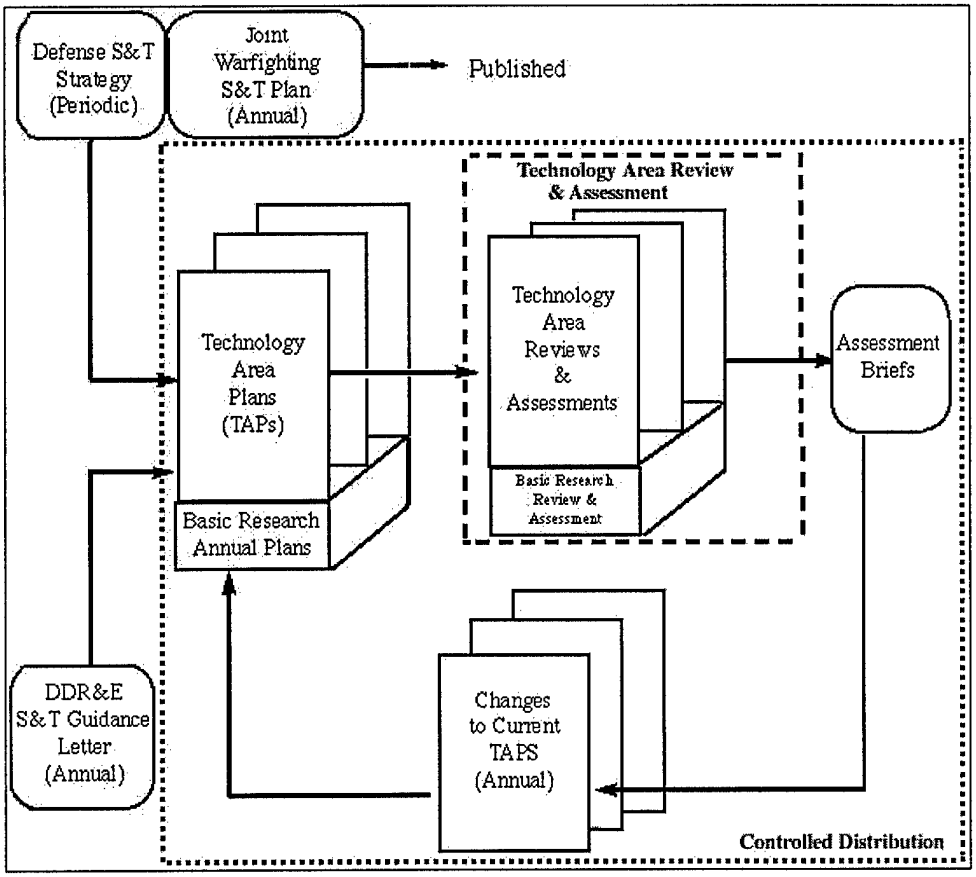


Figure H-2. S&T Reliance Process

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APPENDIX I

TEST AND EVALUATION RELIANCE AND INVESTMENT PROCESS

Test and Evaluation Reliance

In response to a 1989 Defense Management Review Decision (DMRD), the Services proposed, and OSD approved, the creation of T&E Reliance. Reliance represents a corporate and cooperative management approach to T&E. It vests more responsibility in OSD for corporate T&E planning, and promotes coordinated, centralized investment planning without inhibiting the decentralized execution of testing. Reliance helps to reduce unwarranted duplication and provides information to guide decisions on investments, reductions, and closures.

Reliance began with corporate studies that started at the field level and examined existing test capabilities and management alternatives. The results of the Reliance studies provide the basis for future test investments and define the test capability needed into the next century. These studies resulted in recommendations regarding DoD management approaches by area of test capability.

Under Reliance, a single manager or Lead is generally assigned responsibility for planning for DoD test capability in a specific area. The Lead is responsible for fostering cross-service management arrangements, identifying unwarranted duplication, and making recommendations to improve test facility management. The Lead serves as the DoD point of contact for the investment area and is responsible for coordinating all Service resource requirements within the investment area. The Leads and the classes of test facilities for which they are responsible are listed in Table I-1.

The Reliance process has led to such consolidations as the transfer of functions at the Navy's Trenton, NJ facility to the Air Force's Arnold Engineering Development Center, in TN; the closure of the TRESTLE test facility, in NM; and an improved Central T&E Investment Program.

Reliance areas and current Reliance lead services are as shown in Table I-1.

Table I-1. Reliance Lead Services and Agencies

Reliance Area	Reliance Lead
Land Vehicles Testing	Army
Chemical Weapons/Chemical Biological Defense Testing	Army
Gun Munitions Testing	Army
Targets	Joint Target Oversight Council
Full-scale fixed wing	Air Force
Sub-scale fixed wing	Navy
Rotary wing	Army
Towed	Navy
Missile	Navy
Non-cooperative scoring	Navy
Mobile ground targets	Army
Target command and control	Air Force
RF emitters	Navy
Sea targets	Navy
Surface-to-Air Weapons Testing	Army
Air-to-Air Missiles Testing	Navy
Air-to-Surface Weapons Testing	Air Force
Nuclear Weapons Effects Testing	Defense Nuclear Agency (DNA)
Electric Gun Testing	Army
Air Breathing Engine Test	
Large and Medium Engines	Air Force
Small Engines	Navy
T&E Support Aircraft	Air Force
Fixed-Wing Aircraft Testing	Fixed-Wing Cooperative Committee
Electronic Warfare Testing	EW T&E Resource Office
(including RCS Facilities and Anechoic Chambers)	Air Force
Digital model and computer simulation	Navy
Hardware-in-the-Loop	Navy
Installed systems	Air Force
Open air ranges	Navy
Initial Lead for RCS Measurement	
Sub-lead for land vehicles	Army
Sub-lead for sea vehicles	Navy
Sub-lead for air vehicles	Air Force
Climatic Test Facilities	Air Force
Global Positioning System	Air Force
Time-Space Position Information (GPS TSPI)	
Supersonic Sled Tracks	Air Force
Common Airborne Instrumentation System	Navy

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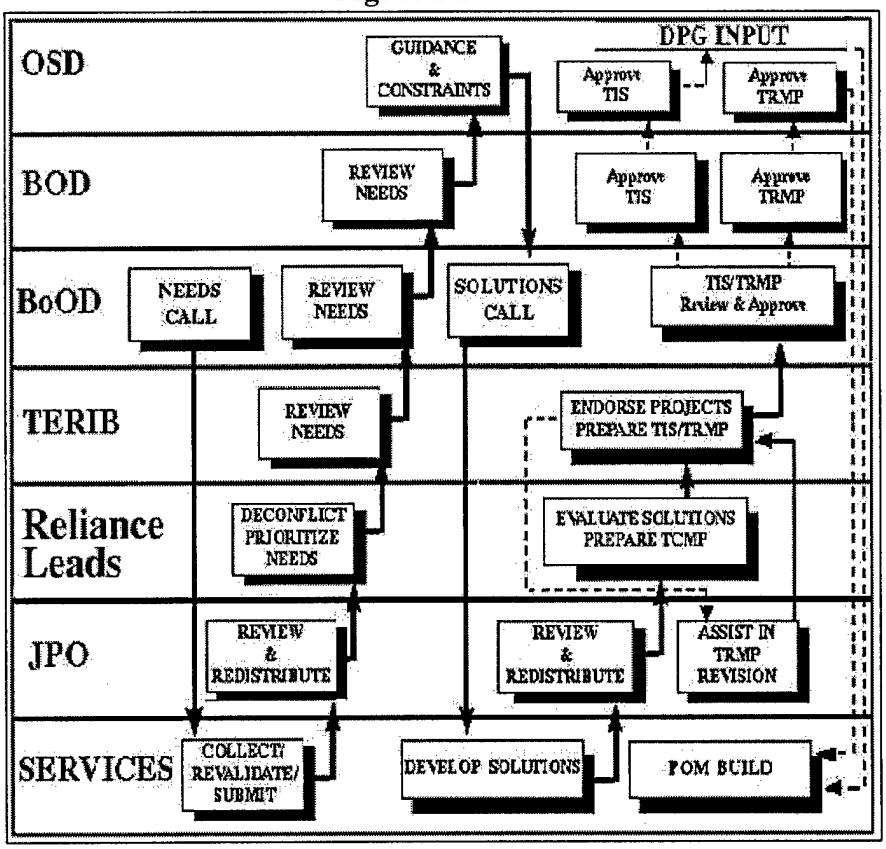
Test Investment Process

The current Test Investment Review process focuses on investments with costs of $1 million or more in a single year or $5 million over the total project. Two categories of investments are covered by the process: Service-unique and Joint Service investments. The Services fund the former, while the latter may be cooperatively funded by more than one Service or through the Central Test and Evaluation Investment Program (CTEIP). The review process for Service-recommended investments consists of the steps illustrated by Figure I-1. CTEIP-funded projects are approved by a separate review process and are not addressed in Figure I-1

The Joint Program Office for Test and Evaluation (JPO(T&E)) initiates the process with a Needs call to Service Headquarters. This call is for test and evaluation investment Needs to address known test capability shortfalls within the Service framework. The Services then promulgate the call using their individual processes, and Need statements are generated. Each Service then collects, validates, and integrates their test resource Needs and submits them to the Joint Program Office for Test and Evaluation (JPO).

Figure I-1. The Test Investment Process



Upon receipt of each Service's list of Needs, the JPO groups them into Reliance areas and parcels them out to the appropriate Reliance Leads. Under the management of the Leads, Reliance Panels evaluate the Needs and recommend endorsement/non-endorsement. The Panels also seek opportunities to combine Needs and resolve conflicts. The lists are then returned to the JPO, which performs the administrative function of collecting the lists and distributing them to the Test and Evaluation Reliance Investment Board (TERIB).

The TERIB's primary functions in the process are to deconflict across Reliance areas and to separate those projects that may qualify for joint funding from those that meet only single Service needs. The joint Needs are prioritized and forwarded to the Board of Operating

Directors (BoOD).

After review, the BoOD forwards all Needs to the BoD and the Defense Test and Training Steering Group (DTTSG). The Test and Evaluation Resource Committee (TERC) integrates the Service joint Needs for which CTEIP funding is sought with Defense Agency Needs, and forwards the integrated CTEIP Needs to the DTTSG. Constraints for Solutions are developed by the DTTSG and the BoD. Initial inputs to the Defense Planning Guidance are provided to the DTTSG.

Through the DTTSG, OSD (DTSE&E) reviews both CTEIP and Service Needs. It then issues any constraints or guidance to be used in the development of Solutions to satisfy those Needs endorsed by the BoD (for Service) and the TERC (for CTEIP).

Once the OSD endorses the Needs lists and issues constraints and guidance, the JPO(T&E) issues a Solutions call for Service Solutions, and the TERC issues a call for CTEIP Solutions. The Services then respond in a process very similar to that used for the Needs Call. The Solutions are collected, grouped and distributed to cognizant Leads. The Reliance panel reviews the Solutions for endorsement/non-endorsement, and after they are deconflicted and integrated, they are submitted to the TERIB and then to the BoOD and the BoD.

The Test Investment Planning and Review process hinges upon the production of a Test Capability Master Plan (TCMP) for each Reliance area. This document is intended to define T&E efforts within a Lead area. It describes the scope of the Reliance area, test methodology, existing capabilities, and projected test capability requirements (investments). It also provides the overall direction and architecture for the Lead area. The TCMP is the vehicle by which Reliance evaluates new Needs and Solutions for their congruency with planned efforts and the investment strategy. Each Lead uses the results of the Needs and Solutions call to update the previous year's TCMP to reflect new initiatives, strategies, and areas of emphasis. Each area TCMP is forwarded to the TERIB.

The TERIB uses the individual TCMPs and endorsed Solutions to develop two documents: the Test Resource Master Plan (TRMP) and the Test Investment Strategy (TIS). These documents are intended to serve as blueprints to define and guide the Service-wide test investments. The TIS provides a concise statement of the long-term objectives to be gained by these investments. The TRMP serves as the road map to attain the TIS's vision and includes an integrated and prioritized compendium of individual projects intended to execute the plan. The actual process by which Reliance develops the TRMP and the TIS includes various feedback mechanisms whereby the TERIB can confer with Reliance Leads to negotiate acceptable compromises. If participants at the working level cannot reach agreement, the process allows unresolved issues to be carried forward to higher authority (BoOD, BoD, or ultimately DTSE&E). Upon completion of the TRMP and the TIS, the TERIB sends the documents to the BoOD and then the BoD to forward to OSD. This ensures that, in addition to serving to communicate a common investment strategy to the T&E community, the TRMP and TIS are used by OSD in its development of the Defense Planning Guidance. Thus, OSD and the Services will consider T&E investment priorities in their individual Program Objective Memorandums (POMs).

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APPENDIX J

ABBREVIATIONS AND ACRONYMS

AACB	Aeronautics and Astronautics Coordinating Board
AEDC	Arnold Engineering Development Center
AEHA	Army Environmental Hygiene Agency
AFDTC	Air Force Development Test Center
AFEWES	Air Force Electronic Warfare Evaluation Simulator
AFFTC	Air Force Flight Test Center
AMTL	Army Material Technology Laboratory
ARL	Army Research Laboratory
ASL	Atmospheric Sciences Laboratory
ATC	Aberdeen Test Center
ATCOM	Aviation Troop Support Command
ATTC	Aviation Technical Test Center
AVSCOM	Aviation Systems Command
BMDO	Ballistic Missile Defense Organization
BoD	Board of Directors (T&E Executive Agent)
BoOD	Board of Operating Directors (Subordinate to the T&E Executive Agent)
BRAC	Base Realignment and Closure
BRDEC	Belvoir Research, Development and Engineering Center
BRP	Basic Research Plan
DoD	Department of Defense
C4I	Command, Control, Communications, Computers and Intelligence
CECOM	Communications and Electronics
CERL	Construction Engineering Research Lab
CRREL	Cold Regions Research and Engineering Lab
CTEIP	Central Test and Evalution Investment Program
DARPA	Defense Advanced Research Projects Agency
DDR&E	Director, Defense Research and Engineering
DEPSECDEF	Deputy Secretary of Defense

DMRD	Defense Management Review Decision
DNA	Defense Nuclear Agency
DoD	Department of Defense
DOT&E	Director, Operational Test and Evaluation
DPG	Dugway Proving Ground
DSTAG	Defense S&T Advisory Group
DTAP	Defense Technology Area Plan
DTO	Defense Technology Objective
DTSE&E	Director, Test Systems Engineering and Evaluation
DTTSG	Defense Test and Training Steering Group
EMTE	Electromagnetic Test Environment
EPG	Electronic Proving Ground
ETDL	Electronics Technology and Devices Lab
FY	Fiscal Year
FYDP	Future Years Defense Plan
HDL	Harry Diamond Lab
HEL	Human Engineering Lab
HPC	High-Performance Computing
IEW	Intelligence and Electronic Warfare
IPT	Integrated Product Team
ISE	In-Service Engineering
IWSM	Integrated Weapon System Management
JCSG	Joint Cross-Service Group (BRAC 95 term)
JCSG (T&E)	Joint Cross-Service Group for Test and Evaluation (BRAC 95 term)
JPG	Jefferson Proving Ground
JPO	Joint Program Office
JROC	Joint Requirements Oversight Council
JWCA	Joint Warfighting Capabilities Assessment
JWP	Joint Warfighting Plan
LAIR	Letterman Army Institute of Research
LDP	Laboratory Demonstration Program
LQIP	Laboratory Quality Improvement Program
MICOM	Missile Command
MRTFB	Major Range and Test Facility Base
NASA	National Aeronautics and Space Administration
NAWC	Naval Air Warfare Center
NAWCAD	Naval Air Warfare Center Aircraft Division
NAWCWD	Naval Air Warfare Center Weapons Division
NCCOSC	Naval Command, Control, and Ocean Surveillance Center
NMRI	Naval Medical Research Institute
NOARL	Naval Oceanographic and Atmospheric Research Laboratory
NRL	Naval Research Laboratory
NSTC	National Science and Technology Council
NSWC	Naval Surface Warfare Center

NUWC	Naval Undersea Warfare Center
NVEOD	Night Vision Electro-Optics Directorate
OMB	Office of Management and Budget
OPTEC	Operational Test and Evaluation Command
OSD	Office of the Secretary of Defense
OTEA	Operational Test and Evaluation Agency
PEO	Program Executive Officer
POM	Program Objective Memorandum
PRD	Presidential Review Directive
R&D	Research and Development
REDCAP	Real-Time Digitally Controlled Analyzer Processor Reliance Refers to agreements among Services or agencies whereby there is agreement to rely on one another for capabilities or services rather than duplicating those capabilities or services
RDEC	Research, Development and Engineering Center
RDT&E	Research, Development, Test and Evaluation
RTTC	Redstone Technical Test Center
S&T	Science and Technology
SAE	Service Acquisition Executive
SECDEF	Secretary of Defense
SEL	Atmospheric Sciences Lab
SES	Senior Executive Service
SSCOM	Soldier - Systems Command
ST	Scientist/Technologist
STOL/VSTOL	Short Takeoff and Landing/Very Short Takeoff and Landing
TACOM	Tank-Automotive and Armament Command
TARA	Technology Area Review and Assessment
TARDEC	Tank Automotive Research, Development and Engineering Center
TCMP	Test Capability Master Plan
T&E	Test and Evaluation
TEC	Topographic Engineering Center
TECOM	Test and Evaluation Command
TERC	Test and Evaluation Resource Committee
TERIB	Test and Evaluation Resources Investment Board
TEXCOM	Test and Experimentation Command
TIS	Test Investment Strategy
TOA	Total Obligational Authority
TOR	Terms of Reference
TRADOC	Training and Doctrine Command
TRMP	Test Resource Master Plan
TROSCOM	Troop Support Command
USAARL	Army Aeromedical Research Laboratory
USABRDL	Army Biomedical Research and Development Laboratory
USD(A)	Under Secretary of Defense, Acquisition
USD (A&T)	Under Secretary of Defense, Acquisition and Technology

UTTR	Utah Test and Training Range
VAL	Vulnerability Assessment Lab
WRAIR	Walter Reed Army Institute of Research
WSMR	White Sands Missile Range
YPG	Yuma Proving Ground

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